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VOL. XIX

ST. LOUIS, JULY, 1933

No. 7

ORIGINAL ARTICLES

PRESIDENT'S ADDRESS

NEW YORK SOCIETY OF ORTHODONTISTS*

LOWRIE J. PORTER, D.D.S., NEW YORK, N. Y.

ONCE a year it becomes the privilege of the President of your Society to present a short address to give, if possible, any helpful suggestions for the improvement of the Society or profession.

After careful study I am about to present to you for your consideration a few matters which I am convinced will be most beneficial to the progress of this Society.

Before entering into these suggestions I wish to express my personal appreciation to the officers and committees who have worked so faithfully with me this year. They have earnestly endeavored to present such papers, case reports and clinics as they felt would be worthy of your time and which would be beneficial to you in your practical office work or which, through the allied professions, might be a help to you in broadening your knowledge and thus be a general aid to you in your earnest endeavors to render better service to your patients.

It has been the feeling of your officers that the Society meetings should not be held with the primary object of teaching orthodontic technics but rather, for this year at least, should entertain broader programs carrying a wider scope of subjects in allied fields of relative scientific value.

We, therefore, invited some of our medical and dental confreres to render various addresses, the titles and contents of which had been suggested to them by your officers.

At our last meeting we had Dr. Imperatori, who showed us the great dangers of respiratory and intestinal infections which may result from swal-

*Meeting held March 13, 1933.

lowing or inhaling dental apparatus of various types. This was very important to us as orthodontists, warning us so to construct our appliances that we may guard against any such mishap with its possible serious if not fatal result. He pointed out the grave responsibility which we must assume in our practices.

Dr. Hirshfeld showed us the resultant periodontal disturbances from various irregularities which it may be our privilege as orthodontists to prevent.

Dr. McBeath showed lantern slides of the recognizable mouth symptoms of various children's diseases, with which we should be sufficiently familiar to protect other patients, and Dr. Nivert dealt with the connection of rhinology and orthodontia from the medical aspect.

I mention a few of these because my attention has been called to an unofficial report of the last meeting of this Society which appeared in a new magazine, the *Review of Orthodontia*, edited by Dr. Dewey. A letter to me from Dr. Dewey states that this was a combined article written by Doctors Riesner and Dewey, although the entire article as published was credited to Dr. Riesner by an editorial error. I have been asked to announce that the first part of this article, which was an excellent review of Dr. Charles Baker's paper, was written by Dr. Riesner, while the balance, which was largely non-constructive criticism, was written by Dr. Dewey.

It is most unfortunate that one of our members should feel it his duty to write and publish such an article. I can assure the entire membership that any constructive criticism is most welcome and with such cooperation your Society and its programs are bound to improve, but a published criticism, which is going to discourage essayists from coming before the Society and which could greatly harm the cooperative feeling between the medical and dental professions is surely a regrettable mistake which I feel should not go unchallenged by your president.

I wish it thoroughly understood that this is not written because of any personal grievance against Dr. Dewey, but rather it is a protest against methods, which Dr. Dewey has apparently adopted in his publication which in my opinion are wrong and if continued could do great damage to the progress of our profession; and because of this I would feel it my duty, regardless of who had written these criticisms, to offer a protest on behalf of your Society.

It is my earnest hope that such an unfortunate thing may not be repeated, and I trust that our essayists may not feel that by appearing before our Society their efforts are to be ridiculed and broadcast through a publication which is not the official organ of the Society.

It now becomes my duty to call your attention to certain unfortunate procedures of some of our fellow practitioners. I am referring to the act of fee splitting in orthodontic cases.

As you all know this procedure is considered a violation of the ethics of this Society, of the American Society of Orthodontists, the New York State Dental Society, the American Dental Association and also the American Medical Association.

Perhaps some have not realized the seriousness of this procedure, with the consequent possible loss of their license to practice dentistry. A dental

license is not considered a right but is rather a privilege offered by the state to those who are so qualified.

I shall not go into the various evils of such practice, for I am sure you all realize that the greater percentage of commissions must be given by the most inferior workmen and that the superior dentist, who naturally has a larger practice, is going to feel inclined to give a smaller percentage, if any.

This in time means that the less conscientious dentist will refer his cases to the men offering the greatest commissions for selfish financial reasons, regardless of the fact that he realizes the inferiority of workmanship. Thus the public suffers by paying larger fees for inferior service, and dentistry results in a competition of greater percentages of commissions rather than a higher standard of dental perfection and professional idealism.

Fee splitting must always be done as a dishonorable act, for no dentist is willing to have a patient's bill rendered by the orthodontist as follows: so much for Dr. X for referring the case, and so much for orthodontic services. Neither is he personally willing to render a bill to a patient for referring the case.

If this practice cannot be carried on above board and with the patient's knowledge, then it is an unworthy and unjustifiable act and should be discouraged and exposed.

I call your attention to Article XI, Section 1, of the Constitution of this Society:

"The payment of any commission, honorarium, or fee by any member of this Society in consideration for the reference of a patient, shall be sufficient cause for the expulsion of said member by a vote of the Society after conviction."

Fee splitting is a very serious offense which I believe warrants the reading of a letter from Minor J. Terry, Secretary of the New York State Board of Dental Examiners. This letter was also read by Dr. Waugh in 1928 when he was president of this Society. Dr. Terry's letter reads as follows:

"Fee splitting is a nefarious practice and the member of any profession guilty of such practice should have his license revoked, whether he be a member of the dental, medical, or any other profession. In my opinion it is one of the grossest offenses constituting unprofessional conduct, and there would be no hesitancy on the part of this Department in instituting proceedings against the dentist who is guilty of participating in such a practice.

"In my opinion the hold-up man has more honor than a man who extracts an excessive fee from an individual seeking medical relief for the purpose of dividing it with another member of the same or another profession. You are at perfect liberty, if you desire, to quote me on this matter."

I have asked Dr. Waugh to bring a lantern slide which I here present. This is a photograph of an announcement card which has recently been sent to many New York dentists, offering them a 20 per cent commission on cases which are referred to him. This man is liable to the State Board, and upon conviction, we are reliably informed, would be subject to having his license

revoked. I have heard rumors of others (and some very prominent men) who follow this practice although not perhaps so openly, but they are none the less guilty or liable.

I now have three recommendations which I wish to submit for your consideration. After having been Secretary of this Society for several years and President for one year, it has appeared to me that our Society with close to two hundred members should have an editor for our publications, and that the editor should be an elected officer. Our Secretary-Treasurer has many duties to perform which take much time from his practice; while he has always willingly assumed all such duties, it is my opinion that he should be relieved of the necessarily rather burdensome editorial responsibilities.

The editor's duties are to procure from the authors the manuscript to be published. This must be revised according to the journal of publication. There is necessarily a good deal of rearrangement and revision regarding alterations, footnotes, bibliography and references to literature. When the manuscript is completed, it must be forwarded to the printer who returns it in galley proof. This proof must be read and corrections properly indicated of typographical errors, omissions, etc. I therefore believe this to be a progressive step and I strongly recommend that the By-Laws be so changed as to provide for the election of an editor.

One should be selected who is adept and interested in this type of work. The work of revising manuscripts for publication and the subsequent details relating to their publication require special journalistic training, and consequently the nomination of an editor should be carefully considered in order that the office may be suitably filled.

This brings me to my second recommendation—that of the appointment of a Nominating Committee. The progress of a Society depends very largely upon the selection of the society officers.

The act of nomination should not be an offhand friendly act of conferring an honor upon some acquaintance. The officers selected by you should be men who are especially qualified to fill that particular position. An amendment of this kind was voted upon last year and was lost by a small number of votes.

It is my opinion that nominations would be more carefully made if a committee were appointed to study this matter before presenting nominations on the floor. This would in no way prevent any one else from nominating another whom he felt would be a better candidate for the position, and consequently there would be no curtailment of democracy.

Nominations are often made before this Society when but few members are present, and these often disinterested and frequently not even knowing that nominations are to be in order. This results in having nominations made in which the qualifications of the candidate have not been carefully weighed in the light of personal suitability and with the necessary interest at heart in the welfare of the organization.

A Nominating Committee would insure that at least one candidate proposed would have been most carefully selected, and nominations would not

be a haphazard selection hurriedly thought of because the presiding officer was calling for nominations, as has happened before this as well as other societies.

It is my feeling that a Nominating Committee consisting of the members of the Board of Censors as was proposed last year would be an excellent selection, as this would be an unbiased committee consisting of three preceding past presidents who would certainly have the interest of the Society at heart. This would make an ever changing committee, as the Board of Censors is also ever changing.

While it would be necessary for them to nominate a member to replace the retiring member of the Board of Censors, this action could not be criticized, as it has been an established precedent to nominate the retiring president.

Each member of the Board would be personally interested and most anxious to have capable and worthy officers. If any member or group of members felt that another candidate were more desirable, he should feel it his privilege and duty to make such a nomination. This should be greatly encouraged, for any nominee selected to oppose the selection of the Nominating Committee would not be a haphazard act but would be a well thought out proposition meriting worthy consideration. This candidate could not possibly be considered a Bolshevik as was suggested last year, and neither would the member making the nomination, for I credit our Society with having the intelligence to select the most worthy and desirable candidate.

I earnestly hope that the recommendation to have a Nominating Committee be reconsidered. Regardless of whether this Committee be appointed or elected, I believe it to be a sound and a most beneficial change in our Society proceedings.

During the past year the Executive Committee has varied the arrangement of meetings from the proposed plan of the Constitution and By-Laws. The By-Laws call for three one-day meetings each year. The original plan was for one day in October, one in December, and one in March. Last year because of the Greater New York December meeting it seemed wise to hold a one-day meeting in the fall and a two-day meeting in the spring. The latter meeting seemed to work out so well that your Executive Committee decided to attempt having both the fall and spring meetings of two days each.

This made an ideal arrangement for both the New York as well as the out of town members, as it made their trip to New York of double benefit with very little more expense. We have also found that meetings held on a Monday and Tuesday of the week have been advantageous, as this allows members to come to New York for the preceding week-end if they desire.

It is my belief that the adoption of this plan for our future meetings would be of great benefit to the welfare of this Society.

If these recommendations are of interest to you, I shall be happy to see them adopted, for they are presented after careful consideration from many different angles.

Now I wish to express to you my deep gratitude for allowing me the distinct pleasure of serving as your President for the past year. It has indeed been a privilege which I shall long cherish.

If the administration has in any way been successful, it is because of the constant, untiring efforts of the officers, committees and members who have so faithfully worked with me. To them I offer my utmost appreciation. It now becomes my greatest wish and desire to pledge myself always to exert my greatest efforts and energy toward the upbuilding, improving and upholding of the high standards which have been our past history and which were the ideals and desires of our founder, past president and ardent worker, Bill Fisher, who is no longer with us.

NOTE (by N. Y. S. O. Editor).—Following the report of the Advisory Committee, a very interesting discussion ensued.

Concerning that portion of the "President's Address" dealing with orthodontic reviews and printed comments of private opinions, it was the general feeling that the President had no personal intentions but that his references were made for the constructive benefit of dentistry.

After considerable discussion, a friendly feeling was established when Doctor Dewey assured the Society that henceforth he would try to make reports of meetings which would not be embarrassing either to the Society or to the essayists.

The President's references to fee splitting seemed timely, since one or two cases of this nature had been referred to the officers of the Society. Fortunately the men reported are not members of the New York Society of Orthodontists. The President's intention was merely to point out the seriousness of such an offense in order that the high plane of ethics characteristic of this Society might not in any way be lowered by its members.

—J. D. E.

MEASURING FORCES OF DISPLACEMENT IN ORTHODONTIC SPRING APPLIANCES*

GEORGE R. MOORE, D.D.S., M.S., AND F. A. PEYTON, M.S., ANN ARBOR, MICH.

IT APPEARS from the literature that but little work has been done on the actual measurement of forces exerted by displacement of auxiliary springs used in orthodontia. We have reviewed the literature for methods of measuring displacement forces, sometimes referred to as flexibility or resilience, in differently designed springs. Nowack¹ has employed a method described in detail by Korkhaus² involving the use of the calibrated spring balance principle. With this apparatus Nowack has examined some of the more common types of finger springs and has furnished measurements in table form. The measurements of Nowack, however, are limited mainly to the use of single points of loading with a brief table indicating the effects of applying forces simultaneously at two or more points. Schwarz³ has made use of these data of Nowack in his experimental biologic study on the jaws of dogs to determine the tissue changes incidental to orthodontic tooth movement. Measurements of the pressures developed by orthodontic appliances have also been reported by Irish.⁴

From a mathematical standpoint, Brumfield,^{5, 6} has determined the structural features and limitations of orthodontic materials and appliances. By making use of the known physical properties of the materials, numerous tables have been computed for the loads, stresses and flexibilities of the principal designs and loadings of the springs, using a wire of given diameter. McKeag⁷ has discussed the common physical laws in relation to the design of orthodontic appliances. Announcement of other physical properties and methods of testing has been made by Williams⁸ and by Taylor, Paffenbarger, and Sweeney for the Bureau of Standards.⁹

In our investigation use has been made of a movable, short range telescope, or cathetometer, for measuring the displacement of springs when loaded with definite weights. Figs. 1 and 2 illustrate the method employed. The telescope is provided with a cross hair that can be raised or lowered until focused on the upper side of the spring that is being displaced. It is also mounted on a pivot so that it may be readily sighted horizontally to any point on the spring, as well as moved vertically. The upright support is graduated in millimeters and equipped with a vernier that enables reading accurately to 0.10 mm. (0.0039 inch). The springs are simply supported in a broach holder or pin vice that is clamped to the stand as shown in Fig. 2. Graduated gram weights are added to the basket which is hooked on the spring at measured distances from the grip. These applied weights cause displacement

*Preliminary report of part of work to be presented by F. A. Peyton as thesis for the Doctor of Science degree, Graduate School, University of Michigan.

of the spring. The displacements are measured by again lowering the telescope until the cross hair is focused on the upper side of the spring. The results on a given wire and spring design can readily be checked to ± 0.1 mm. for displacement readings when using a definite load.

This method can be safely employed for measuring forces exerted by orthodontic springs; since it is obvious that the weight necessary to give a definite displacement when applied at a given point can be interpreted in the reverse order for practical purposes. For example, when a spring is displaced a given distance, it exerts a force equal to that force (or weight) necessary to displace it.

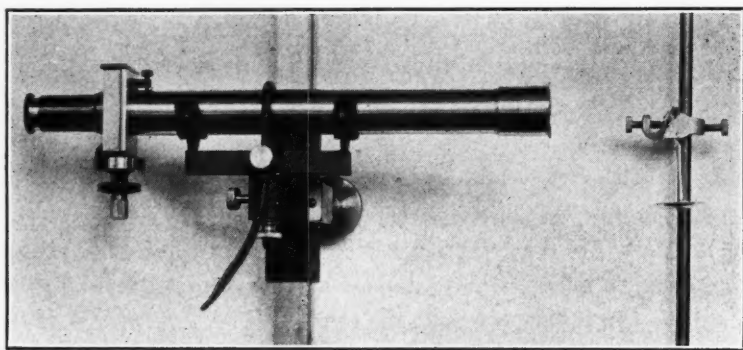


Fig. 1.—Cathetometer for viewing displacements.

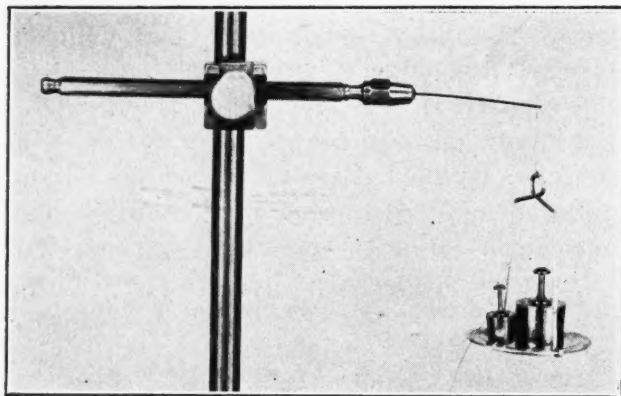


Fig. 2.—Simple spring displaced by load.

Measurements have been made on simple, straight finger springs at 10 mm., 20 mm., and 30 mm. (0.39, 0.78, and 1.17 inch) distance from the grip. The wires tested were all of one product, as received from the factory, and of four diameters—0.018, 0.020, 0.022, and 0.030 inch (0.46, 0.51, 0.56, and 0.77 mm.). All data taken on this type of spring represent the use of a single point of application for the load. The results when tabulated and plotted graphically show relationships between wire diameters and spring lengths.

Measurements have also been made using simple reflex springs with one point of load application. The load was applied at 10 mm. intervals on a 30 mm. spring, changing not only the distance from the grip to the bend, but also the distance of application from the bend to the free end of the spring.

The measurements were all made on wire of 0.018 inch diameter as received. The spring was formed by cold bending the wire around a 0.045 inch (1.15 mm.) wire.

Further measurements were made on simple reflex springs using two or more points of application simultaneously. Using these springs we have tabulated the effects (1) of changing the length from the grip to the bend, (2) of changing position of two simultaneously applied loads, (3) of placing equal weights at two varying positions, and (4) of placing equal weights at three points simultaneously. The wire used in this spring was 0.022 inch in diameter. The spring was formed by cold bending as in the case mentioned above, and no heat treatment was given it.

At the present time measurements are being made on appliances taken from practical orthodontic cases, similar in design and wire size to those formed in the laboratory. Representative measurements are also under way on wires of other products and on wires that have been heat treated. This method of measuring force-displacement relationships is also being used for measuring forces exerted by the twin wire appliance as designed by Johnson.¹⁰ By making use of a formula for flexibility, computations are being made on representative springs for the purpose of checking the calculated results with observed data. Other physical properties, such as microcharacter hardness, tensile strength, and microstructure of the wires, are also being investigated.

Means of applying preliminary results of this investigation have already begun to suggest themselves. For example, hypothetically in the practical case involving stimulation of the mandibular incisor region, orthodontists very often wish to approach a uniform distribution of stress delivered by a reflex spring to each of the four incisors. Not only are we able to test the stresses delivered simultaneously at each of two or more points along the outer limb of the reflex spring, but by means of the graphs already referred to, it is possible to make determinations which may lead to improvement of spring design. One formula about to be derived will inform the orthodontist how long to make the soldered limb of a reflex in proportion to its free limb in order to deliver equal stresses at each of two or more points.

The work is being done, however, with a full realization of the fact that changes in the amount of stress will take place from day to day in practical orthodontic treatment, as the effects of spring stimulus progress.

Work of this kind must be carried on from simple beginnings, while the complex conditions presented by the physiology of the oral tissues can be simulated, if ever, only after relatively elementary mechanical problems are solved.

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FOREIGN BODIES OF DENTAL ORIGIN IN THE RESPIRATORY AND DIGESTIVE TRACT: THEIR DIAGNOSIS AND TREATMENT*

CHARLES J. IMPERATORI, M.D., NEW YORK, N. Y.

Professor of Laryngology (New York Post Graduate Medical School and Hospital) Columbia University, Clinical Professor of Otolaryngology, New York University

IN PRESENTING a topic such as this before a society of highly trained specialists, whose specialty dates back to 4000 B.C., and the records of which are deciphered in the Papyrus Ebers, one must feel highly honored.

It is remarkable that in the hundreds of thousands of mouth examinations, and instrumentations which are conducted yearly by dentists throughout the United States and elsewhere, that so few foreign bodies enter the airways or food passages.^{1, 2, 3} This may appear to be a left-handed tribute to their care and skill in operating in and around the mouth. However, no such innuendo is intended, for when one considers the smallness of the instruments, the stertorous breathing at times of the patients, particularly with deep aspiratory efforts, it can only be the skill and the various precautionary measures used that prevent the loss—aspiration—of these appliances.

CLASSIFICATION

The actual loss of teeth in their removal is not so common as the loss of particles of fractured teeth. Dentures that are lost during operative removal are not so common. The various types of substances of dental origin that may enter the human body may be classified into three groups.

First, the aspiration of instruments, dentures or teeth, or particles of teeth, or blood clots and bacteria, during attempted removal by the exodontist.

Second, the aspiration of dentures during sleep or stupor, whether from alcohol or from drugs, or the inexcusable accident of administering a general anesthesia with a denture in the mouth.

Third, aspiration of a tooth following an accident in which the patient has received a blow in the mouth or the attempt by a parent to remove a loose deciduous tooth.

Of course, any of these substances (teeth, dentures, instruments or blood clots) that are permitted to remain within the airway, produce a pathologic condition in the lung. In a series of 100 cases of lung abscesses, an analysis showed that 60 followed surgical procedures, of which 36 per cent followed tonsillectomies, 8 per cent followed removal of teeth, 16 per cent followed some other surgical procedure, and the remaining 40 per cent followed some upper respiratory infection. All these patients had received a general anes-

*Read before the New York Academy of Dentistry, Feb. 11, 1932; and the New York Society of Orthodontists, Nov. 15, 1932.

thetic. We know that lung abscesses, in many instances, have followed the extraction of teeth. Not that the teeth or particles of the teeth were lost, but infected clots or detritus was aspirated into the fourth or fifth division bronchi during the operation. Gangrene, putrefaction and liquefaction of the tissues of the lung, resulted.

In general, long, narrow dentures, single teeth, fragments of teeth, or small instruments are aspirated into the airways while the larger and irregularly shaped dentures usually lodge in the upper food passages.

DIAGNOSIS AND LOCALIZATION

The important consideration where a foreign substance has been aspirated into the human body, regardless of its nature, is to establish a diagnosis as to its presence and to localize its position. The symptoms that occur depend entirely upon the size, shape, and nature of the foreign body. The large foreign body that is in the lower part of the pharynx will produce difficulty in swallowing to the point of total inability to swallow. A small narrow foreign body in the bronchi may produce practically no symptoms

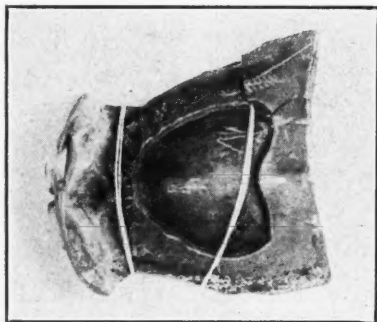


Fig. 1.—G. G., patient aged fifty years. Tooth plate. In situ three months. Located in the esophagus, opposite the first and second dorsal vertebrae. Symptoms were inability to swallow even fluids, necessitating gastrostomy. Previous attempt at removal elsewhere had resulted in injury to the esophagus and subsequent subcutaneous emphysema of the whole body. The emphysema persisted for about two weeks. When this subsided, the tooth plate was removed by esophagoscopy, under general anesthesia. Gastrostomy wound closed within two weeks following removal of tooth plate. Results: Patient cured.

other than occasional cough. (See Figs. 1-8.*) Of course, a foreign substance such as a piece of tooth or an infected clot or a piece of tissue, if aspirated into the lung tissues, is difficult to diagnose.

Until a definite lung pathologic condition has developed, few symptoms supervene. The incidental blocking and plugging of the smaller bronchi with the wedge-shaped area of lung that it supplies, may very rapidly give definite x-ray findings. Physical signs may be present, also depending upon the size of the lung tissue involved.

The asthmatoïd wheeze^{4, 5} that has been described by Dr. MacRae and Dr. Jackson, when present, should definitely indicate the possibility of a foreign body in the lung. The aphorism of Jackson's is very apropos, "All is not asthma that wheezes." Of course, large foreign bodies in the bronchi that

*In the description of removal of the foreign bodies detailed, and where the term removed by "esophagoscopy, laryngoscopy or bronchoscopy" is used—the technic of Chevalier Jackson is followed both as to the position of the patient and as to the type of instruments used.

are not opaque to the roentgen ray are diagnosed by the changes they induce in the lung tissues. If complete occlusion of the bronchus occurs, then there is atelectasis, or absence of air in lung tissue. If the foreign body is almost completely surrounded by air, then very little of the lung pathologic conditions occurs. If partial occlusion occurs, there is more or less trapping of

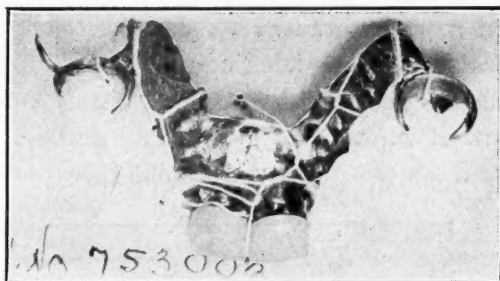


Fig. 2.—J. P., patient aged twenty-five years. Tooth plate. In situ 5 days. Swallowed during sleep. Diagnosis made by x-ray picture, and the foreign body was located in the esophagus, below the cricopharyngis. Symptoms were inability to swallow even fluids. Previous attempt at removal, elsewhere, had been unsuccessful. Removed by esophagoscopy with no anesthesia. Results: Patient cured.

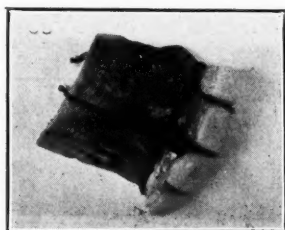


Fig. 3.—H. H., patient aged twenty-nine years. Tooth plate. In situ three days. Lost during sleep. Diagnosis made by x-ray examination, and the foreign body was located at fourth dorsal vertebrae in esophagus. Symptoms were total inability to swallow. Patient considerably dehydrated. Removed by esophagoscopy, using Dean expanding esophagoscope, general anesthesia. Results: Patient cured.



Fig. 4.—A. N., patient aged thirty-five years. Dental plate. In situ twenty hours. Diagnosis made by x-ray examination, and the foreign body was located in esophagus, having dropped from mouth during sleep. Symptoms were total inability to swallow, with some pain radiating to the ear. An attempt had been made elsewhere, to remove it, unsuccessfully. Removed by esophagoscopy, with no anesthesia. Results: Patient cured.

the air on that side, dependent upon the amount of irritation of the bronchial mucosa at the site of the foreign body.

This condition is termed obstructive emphysema, the lung itself being ballooned with air that cannot escape on expiration. This is caused by the foreign body and the incidental mucosal irritation producing an obstruction similar to a ball valve. The condition roentgenographically must be differen-

tiated from compensatory emphysema, where the opposite lung is atelectatic and its fellow is overfunctioning.

In passing, lung collapse following certain abdominal operations in the upper quadrants of the abdomen is a misnomer and is really an atelectasis produced by an obstruction of the main bronchus with a plug of mucus.

Lung collapse should mean that the lung tissues are contracted down around the hilus and a pneumothorax exists. In other words, the negative pressure in the pleural cavity has been overcome and there is a positive one.

Localizations must be accomplished and definitely settled in the minds of the operators both in the anteroposterior and in the lateral planes before arriving at a positive diagnosis. Ordinarily flat foreign bodies in the esopha-

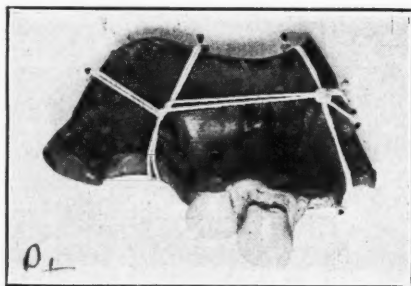


Fig. 5.—E. B. S., patient aged sixty-one years. Tooth plate. In situ thirteen hours. While eating gingersnaps, broke denture and part of it was swallowed. Diagnosis made by x-ray examination, and the foreign body was located in esophagus, opposite seventh cervical vertebrae. Symptom was that patient could not swallow solids. Removed by esophagoscopy, under local anesthesia. Results: Patient cured.

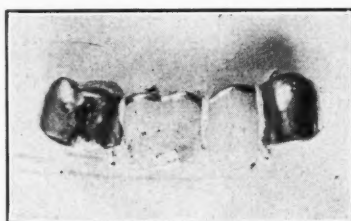


Fig. 6.—S. S., patient aged fifty years. Denture of 2 crowns and 2 teeth. In situ forty-eight hours. Lost by dentist during removal. Diagnosis made by x-ray examination, and the foreign body was located at the termination of the left main bronchus. There were no symptoms. Removed by bronchoscopy, under local anesthesia. Results: Patient cured.

gus ray in such a manner that their greatest diameter is shown when the ray is anteroposterior; if in the larynx, the edge of the foreign body is shown.

Long thin foreign bodies in the bronchi in the anteroposterior plane are usually at an angle to the spine. Also a similar condition exists on the lateral view. If in the esophagus, they are usually parallel to the spine.

In case of a lost instrument or other foreign body that is inhaled or swallowed, the responsibility rests with the individual who lost the instrument, etc., and an immediate diagnosis should be made to exclude the possibility of the foreign body's being within the patient. Fluoroscopy when negative is very misleading, and a proper roentgenogram must be taken,^{6, 7} from the occiput to the tuber ischii. In the event that the roentgenogram does not show the supposed lost foreign body and it has not been found outside the patient, then further roentgenograms must be taken and bronchoscopy should

be instituted. Of course, if the foreign body is within the stomach or the lower intestinal tract, daily observations should be made to determine whether or not the foreign substance has come to rest. If it remains in one place for a period of from five to ten days, and if the foreign body is of a decidedly pointed nature, laparotomy must be considered. The reason for this is that a sharp pointed foreign body may penetrate the intestinal wall and produce a fatal peritonitis.

Because the majority of these foreign bodies pass through the intestinal tract, it must not be considered that they all do and that the danger is entirely over after the foreign body leaves the stomach.

Considerable mortality exists in cows and sheep following the swallowing of a piece of wire, nails, etc. They die from perforation of the intestine.

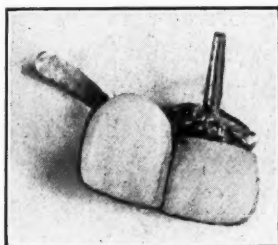


Fig. 7.—C. B., patient aged fifty-seven years. Pivot with two teeth and clasp in situ twenty hours. Denture lost during sleep. Diagnosis made by x-ray examination, and the foreign body was located in lower part of right main bronchus. The patient was awakened by asthmatic seizure. Removed by bronchoscopy, under local anesthesia. Results: patient cured.



Fig. 8.—E. M. T., patient aged forty-five years. Dental root canal reamer in situ four days. Diagnosis made by x-ray examination, and the foreign body was located in the left main bronchus. Symptoms were occasional attacks of coughing. Bronchoscopy was done one-half hour after x-ray examination, and foreign body was found in the right middle lobe bronchus. Local anesthesia. Results: patient cured.

Certain metals such as aluminum are very slightly nonradiopaque and do not give much of an x-ray shadow. Artificial teeth and occasionally deciduous teeth give very little shadow. If a roentgenogram in such a case is negative, pneumonography with the use of lipiodol may materially help, and particularly so if there is a suggestion in the physical examination and in the roentgenogram that there is an area of atelectasis and decided diminished breath sounds over that portion of the lung. A foreign body may be in a third division bronchus, and even bronchoscopy cannot visualize it.

The injection of lipiodol or the insufflation of bismuth subcarbonate may materially help in the localization of a partially nonradiopaque foreign body.

SUMMARY

In 1759, on a certain Monday morning, a child eight years old, while playing with a dried bean, threw it in the air and caught it in her mouth and inhaled it. She was taken to the Charité Hospital in Paris and there seen by the famous Louis. He made a diagnosis on the physical signs which consisted of marked difficulty in breathing and the history.

He suggested that the parents permit him to do what was called a bronchotomy, being certain that the bean was localized in the trachea. In those days a tracheotomy was called a bronchotomy. The parents refused this operation. The child died within two days, and at postmortem examination it was found that the bean was in the trachea, and that if the suggestions of Louis had been followed out, the child probably would have been saved.

This is one of the first recorded histories of a foreign substance that was diagnosed definitely ante mortem and a proper procedure suggested that was not carried out and at postmortem the findings were corroborated.

A careful history and notes of the accident of swallowing or inhaling the foreign substance should be made.

Inspection of fauces and indirect examination of the larynx should be done.

Physical examination of the chest should be made by inspection, palpation, percussion, and auscultation.

Immediate choking and subsequent coughing should direct one's attention to the possibility of the inhalation or swallowing of a dental foreign body, particularly should this foreign body be lost.

Fluoroscopy should be accepted if it is positive^s; it is of no consequence if negative. Roentgenograms should be taken in order to study properly the localization, size, presentation, etc., of the foreign substance. Pneumonography to outline and localize a nonradiopaque foreign body. Also to ascertain definitely the bronchus that contains the foreign body.

REMOVAL BY BRONCHOSOPHAGOSCOPY

This is a highly technical branch of laryngology, and the procedure is carried out with the aid of electrically lighted instruments that are lighted either distally or proximally. The original bronchoscope consisted of a metal tube, and the illumination was carried on by way of a headlight. Dr. Gustave Killian of Frieberg, Germany, invented and devised this method of inspection of the airways and food passages. It was further perfected by Dr. Einhorn of New York, who devised the gastroscope that was distally lighted.

All the distally lighted instruments are exemplified in Chevalier Jackson's bronchoscopes and esophagoscopes. It was he who improved them to their present perfected state. The proximally lighted instruments have been gradually perfected so that now the Haslinger is the best example. The advocates of the proximal lighting feel that they can see a further distance beyond the end of the tube than with distally lighted instruments. The distally lighted instruments are less cumbersome and are more delicate to use than the over-balanced proximal lighting ones. The bronchoscopes are made with openings

in their distal ends so that whatever way they are turned they will receive the air from the smaller bronchi. The patient breathes without any effort. Of course all tubes are so much smaller than the trachea or main bronchus that there is no danger of asphyxiation during bronchoscopy. With the proper suction apparatus and the various types of forceps, ordinarily bronchoscopy is not such a difficult procedure as esophagoscopy.

In bronchoscopy, the bronchial tubes are held open by the cartilages, and excepting in those cases with advanced pathologic condition of the lung, the foreign substance can be easily made out and the presenting part seen. In esophagoscopy there is a different problem, because the tube is a collapsible one and will fold around the end of the foreign body so that traction made in an improper axis may very easily tear the esophagus. The esophagus is a very thin walled tube and is located directly in front of the upper vertebral fascia with a small space separating it—the perivisceral space—and this in turn connects with the posterior mediastinum. In front it is loosely connected with the trachea so that an injury of the upper esophagus can easily become a very serious surgical condition. The rupture of the esophagus below the entrance to the chest invariably is fatal. Penetrating wounds frequently puncture the pericardium and produce a purulent pericarditis with fatal outcome. Rarely do these foreign bodies injure the aorta, although the proximity to it is but a few millimeters.

All in all, esophagoscopy in comparison with bronchoscopy is much more difficult. However, the results obtained in comparison to other methods are so brilliant if carried out by expert technicians that all other methods are now obsolete.

Recently the use of the biplane fluoroscope in conjunction with bronchoscopy has become a decided advance in surgical procedure. This method consists of the use of the fluoroscope in the anteroposterior diameter and another in the horizontal. At the same time bronchoscopy is done. Indications for this procedure are a foreign body in the third or fourth division bronchus that cannot be visualized through the bronchoscope. Then with the assistance of the fluoroscopists, the bronchoscopist can guide his forceps into the bronchus that contains the foreign body and grasp it.

Biplane fluoroscopy may be used in removal of foreign bodies in the stomach. On the face of it, this would appear to be an easy surgical procedure, but it is extremely difficult even under the best of circumstances. The foreign body gets in the folds of the stomach and it is difficult to localize it. Ballooning of the stomach with air helps a great deal. Sometimes fluids have been injected or the fluids normally in the stomach have not been aspirated, and this has helped in the localization. The danger of injury to the mucosa of the stomach, etc., is obvious.

Summary.—In regard to immediate removal of foreign bodies from the airways, if in the larynx and if the patient is breathing without any difficulty or discomfort, then no haste is necessary and a careful study should be made before removal is attempted. Theoretically, a foreign body should be removed

as soon as possible. Frequently this is not feasible, and excepting those that are producing marked obstruction to breathing, careful roentgenograms should be taken and studied.

There are frequent complications that make it wiser not to attempt, immediately, removal of a foreign body; and it is better that the foreign body remain in situ until proper removal can be contemplated, rather than that emergency measures be taken that may result in a failure. It is better that a patient have the foreign body within him, than that in the attempt of removal the patient should die or suffer serious complications.

When in the gastrointestinal tract and the foreign body has gotten beyond the esophagus and is in the stomach or beyond, it is advisable that no change in diet be made.^{9, 10} A change will produce either a constipating effect or the opposite on the patient. Then the bulk in the intestinal tract will also be changed and greater danger of injury to the intestines may result. With a normal bulk, normal peristalsis results and foreign substances will probably pass through quickly and without injuring the gut. Catharsis in any form should be avoided because of the induction of a watery content of the intestines. X-ray examination and inspection of the stools are necessary.

AFTER REMOVAL

After the removal of a foreign body, particularly a tooth, the fragments, if there are any, should be collected and the tooth reconstructed. If there were any fragments that occurred before the inhalation, they should be also used to reconstruct the tooth. The identification of the foreign body as of the time previous to the inhalation or ingestion should be compared if possible with a similar object. The necessity of this precaution can be very easily seen. A subsequent x-ray picture is necessary so that a pathologic condition of the tissues of the lung or the possible presence of some other object may be determined, and, if necessary, further search made.

An instrument or a piece of tooth or a denture lost during attempted extraction should be considered potentially a foreign body in the patient, until proved otherwise. Subsequent lung suppuration or perforation of the intestinal tract by a foreign substance may occur, and the burden of the proof that the foreign body is not within the patient rests with the dentist.

Summary.—I have indicated elsewhere the plan of procedure, but in order to stress this important point again, it is suggested that in the loss of a foreign body or instrument or denture which is lost during attempted extraction, an x-ray picture should be taken as soon as possible. The picture should be one that is considered well taken, and depending upon the nature of the foreign body, the definite assertion by the roentgenographer that there is no foreign body must be given to the dentist before he himself can feel relieved of the responsibility.

MEDICOLEGAL ASPECT

The finer feelings that the dentist has in order to avoid worry and consternation in his patient, have to be balanced by the possible assertions that can be made by the patient's attorneys,¹¹ in the event of a lawsuit, that inasmuch

as the dentist did not tell the patient, he was attempting to conceal the fact that the accident had occurred. It is better to tell the patient.

In the event of a possible inhalation of foreign body, or ingestion, an x-ray picture should be taken from occiput to the tuber ischii. Remember that fluoroscopy, if negative, is valueless. Physical signs at times are absent. Even coughing may be absent. Rarely does the patient complain of pain. Only after a period of time has elapsed will pathologic conditions in the lungs or other symptoms in the gastrointestinal tract supervene. If in the respiratory tract or esophagus, insistence should be made that the foreign body be removed. If in the gastrointestinal tract and the foreign body comes to rest for one week or longer, it is advisable that removal be done by laparotomy in order to avoid perforation of the intestine.

Summary.—No attempt to discuss prophylaxis is made other than the suggested outline:

- (a) Prevention of aspiration.
- (b) Position during operations.
- (c) Prevention by use of gauze, rubber dam.
- (d) Suction.
- (e) Anesthetic.
- (f) Advice to all patients to keep dentures in repair.
- (g) All orthodontic appliances to be securely fastened.

It is felt that this phase of the subject should be left to those who are working in this field.

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POSTNORMAL OCCLUSION AS A MANIFESTATION OF THE "LYMPHATIC STATE"*

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TOO often has the accusation been made that the dental profession lacks breadth of vision and full appreciation of the principles of medicine as applied to its own work; not perhaps altogether untruly, for the dental surgeon advances through his early and most impressionable years from the study to the practice of his profession, rather than graduating into it from a generalized working experience of medicine and surgery.

For those of us, therefore, who incline toward orthodontics—itsself a very specialized section of dentistry—the danger is even greater that our horizon should be filled by problems of mechanical technic, to the exclusion of those that deal with the causes of disorderly growth in the living organism. I should like to consider one such problem, and that is inherited predisposition to disease, and its manifestation in dental deformity.

Dr. Hector Cameron has done much work in elucidating the significance of the child's "diathesis"—that is, its inherited predisposition to certain types of abnormality, and had himself early drawn attention to the occurrence of dental irregularity in certain of these conditions.

May I read to you a few lines from his *Diseases of Children* as an apt introduction to our own study of the problem? In his delightfully clear and lucid style he writes as follows: "In this country the word 'diathesis' is a little out of favor, to many the conception of inborn and inherited tendencies to disease is too vague and too little susceptible of proof to be attractive, . . . yet especially in pediatric work it is clear that, during the last twenty years, interest in the conception of inborn and inherited peculiarities of constitution has steadily grown, so that now a vast literature concerns itself with a consideration of the Lymphatic Diathesis, the Neuroarthritic Diathesis, and so on. No doubt these names are in a sense only a cloak to cover our ignorance, but as knowledge advances and more precise information as to the nature of disorders becomes available, the part which is to be attributed to constitutional peculiarity will become less and less.

"Nevertheless the attempt to depict certain types of children who inherit a tendency to suffer from a variety of closely related symptoms is not without a certain value in practice. If experience shows that a too great liability to suffer from particular symptoms, or trains of symptoms, can be prevented, or lessened, by modification of the management generally or of the diet in particular, then the study of diathesis becomes of practical importance, while it need in no way diminish our zeal for precise and accurate diagnosis."

It was my privilege to work under him at Guy's and later under Mr. F. Bocquet Bull's directorship in the children's department of the Dental School, and this is an opportunity to acquaint you with the general results of

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investigation of much orthodontic material considered in the light of such modern conceptions of disease. Clinical estimation and examination of the inherited predisposition to abnormality is particularly easy in the early years, before standardized modes of upbringing and common infections have had time to smear the slate and obscure the message which is there for all of us—who are wise enough—to interpret.

Of these diatheses, analysis of the “catarrhal” or “lymphatic” state—when considered in relation to our own work—yields by far the most fruitful results, and, moreover, has this added advantage, that it can be easily studied by such as ourselves, who have a relatively limited knowledge of medicine and pathology.

As a contrast to the lymphatic state, the “neuroarthritic” or “acidotic” state yields the sharpest contrast, not only clinically and biochemically, but also in relation to such orthodontic manifestations as I am considering here. I shall later briefly describe the characteristics of this type, but only to throw into sharper relief certain features of the object of this study. By what manifestations, then, can we arrive at a definite conclusion as to the presence, and as to the extent, of this inherited predisposition to what—for want of a better term—I have called “lymphatism”?

In appearance as a fat, flabby, usually fair child, the hair coarse in texture, almost towy in nature; eyelashes and eyebrows rather sparse (especially in the outer third), a thick opaque skin, florid cheeks, depressed bridge to the nose with shallow eye sockets, giving an “ironed-out” appearance to the face.

In Mentality.—A tendency to be dull, passive, lethargic, and with slow reaction to both personal and impersonal environment.

Physical examination shows overweight, the whole body, arms, legs, thighs, are too well covered, while the musculature is in poor condition.

Clinical examination discloses one of the characteristic features of the condition, and that is the totally inadequate control of lymph balance in the general body tissue. The tissues are *hydrolabile* or, in other words, without self-government in regard to their water content, so that even slight nutritional defects, especially in regard to excessive carbohydrate intake, in some way cause the watery body fluids to accumulate in and waterlog the whole system, the overflow, as it were, appearing as an exudate of catarrhal type either from the mucous membranes, or from the secreting or excreting systems generally.

There is thus a tendency to running eyes, the conjunctivitis occurring as a complication of measles being often very severe; there is running of the ears, the middle ear complications of scarlet fever tending to become chronic, eventually leading to deafness (although this frequently occurs independently in the lymphatic subject as a result of chronic eustachian catarrh). There is running of the nose so aptly and euphoniouly described as “snuffles,” the lung bases are waterlogged, having as their special symptoms bronchitis and chronic cough, while cuts and scratches do not heal well but remain moist and tend to develop as eczematous condition.

Correlated with—or possibly contingent upon—this inadequate control of lymph balance, there is a most noticeable lack of tissue resistance to the common chronic infections.

Low grade infection of these exudates from the tissues rapidly supervenes, the infected areas draining into the lymph gland systems, so that proliferation of the various related groups of lymphatic glands rapidly occurs; *thus enlarged tonsils and adenoids are very common*, and this is the first signpost for you to remark in regard to this subject, but let us not for one moment forget that the term "lymphatic state" connotes inadequate body lymph balance, *and not in any sense a primary specialized lymph gland change.*

Now those of you engaged wholly in exclusive practice may not readily recognize the rather exaggerated type picture which has been portrayed, but this is simply because the unfavorable elements which play havoc with this tendency are usually not operative.

In hospital practice, on the other hand, these elements of faulty nutrition and catarrhal infection exploit the retrograde possibilities of the lymphatic predisposition to the uttermost; it has already been stated that the waterlogging of the tissues is largely due to excess of carbohydrate food, *and it is carbohydrate that is eaten to excess* by the vast numbers which constitute the lower strata of society, and that only because it is cheap food. Proteins, fats, vegetables and fruits are relatively dear foods, while bread, buns, cakes, potatoes, have a high bulk value and easily satisfy the hunger pangs of a large and clamorous family. Again, under existing economic conditions such children are herded together in schools and grossly overcrowded homes, so that catarrhal infection spreads rapidly, and finds a rich and ever-fruitful soil in the lymphatic subject. On the other hand, among normally well-to-do people, nutrition is not jeopardized by expense, while there is almost always some attempt at collective or individual segregation of infected children.

In this way the grosser symptoms of lymphatism are less manifest, and may in fact be overlooked, but the picture is there, complete in every detail, though its colorings and markings may call for closer scrutiny. So now logically we come to the matter suggested by the title of the paper, so that I must state my case for you to confirm or deny.

This type of child, with its hereditary tendency to waterlogging of the tissues and low resistance to infection, which manifests postnormality and certain maxillary defects of protrusion, as one of its many stigmata, coincident and coequal, with its fair hair, its sparse eyebrows, its enlarged tonsils and adenoids, and its flabby musculature. This generalization is indeed no new supposition, as the coexistence of certain medical conditions with this deformity of the jaws has long since been acknowledged, but the details of that relation have not previously been accurately formulated, and I do feel that this conception does at least bring our work into line with current medical thought in regard to disease.

We can readily survey past approaches to the problem by perusal of previous issues of the Transactions of this Society—sometimes entertaining, always instructive—but in this connection especially so. In 1923 Mr. Davies contributed an article on mouth-breathing in which I read the following: "The mouth-breather of long duration possesses a thin, poorly developed nose, . . . there is early morning dry mouth and headache, there is want of tone and clearness of speech, with susceptibility to catarrhal and middle ear deafness.

Such a patient is susceptible to catarrhal attacks and suffers from prolonged and frequent colds, . . . while the open mouth, flat chest and occasional hardness of hearing give the impression of a want of intelligence and alertness." This is a very fair description of the modern conception of the lymphatic state. Again, in 1914, Mr. T. B. Layton, the otolaryngologist, discussed some investigations into the effects of mouth-breathing on dental deformity.

He writes: "There are four possibilities in the relation of nasal obstruction—due to adenoids—with dental deformity:

"(1) That it is a coincidence that both lesions occur in the same person.

"(2) The two may be dependent upon some common cause.

"(3) That by an associated mouth-breathing, the maxillary deformity may cause nasal obstruction and adenoids.

"(4) That the adenoids, by initiating mouth-breathing, cause the deformity."

In further support of the second view, i. e., that both are dependent upon some common cause, he quotes Rollinson Whittaker as follows: "In a given hundred children suffering from nasal obstruction, one may expect to find about thirty having marked maxillary deformity, while fifty will have fairly normal arches whatever the degree of obstruction. *Maxillary deformity on the one hand, and nasal obstruction on the other, when found present together, are not in any degree whatsoever dependent the one upon the other. Both are independent coincidental manifestations of a general pathologic state which shows many other though less obvious signs, and this condition is, in the main, due to an inadequate thyroid secretion.*"

This is an intensely instructive observation because we now know that iodine and, in some cases, thyroid gland are valuable preparations in the treatment of the lymphatic state. Again, only last year, in an interesting communication to the Society upon postnormal occlusion, Mr. Cale Matthews began in this manner: "During last summer the *Daily Mail* had a National Photographic Competition to decide upon the most beautiful child in England; and in looking through the pictures illustrated in the paper it seemed to me that the majority of these children had postnormal occlusion."

An astute and perfectly correct observation this, and one having the closest bearing upon this subject, because we know that the lymphatic infant—before faulty nutrition and catarrhal infection have taken their toll—is, in Cameron's words, plump and goodly, and in the eyes of lay judges supremely beautiful; necessarily they are blind to the significance of the correlated fair hair, uptilted nose concealing the flattened bridge, and the overplumpness of the limbs, while the floridity of the cheeks passes as an index of perfect health. (A patient exhibiting marked lymphatism was then shown together with several large clinical photographs, together with a series of case reports with small photographic insets.)

And now just for a few moments I should like to draw your attention to a diametrically opposed condition, and that is the predisposition to abnormality known as the "neuroarthritic" or "acidotic" state.

In appearance the child is thin, wiry, pale, and usually dark, the hair is crisp, while the eyebrows are well marked and the eyelashes thick; the eyes are dark, the skin smooth, pale and transparent, while the eye sockets are deep.

In mentality the child is quick, alert, eager, passionate and excitable at times, for no child can be a paragon, and with a rapid reaction to both personal and impersonal environment.

Physical examination shows usually a subnormal weight, the musculature may be ill-conditioned—for a reason to be explained later—but there is no hint of waterlogging of the tissues.

Clinical examination shows that these children tend to an over-ready disturbance of their carbohydrate metabolism. (Normally carbohydrate in the form of sugars, etc., forms a great source of easily utilized energy while fats, which also have a high heat energy value, can only be metabolized to form energy if sufficient carbohydrate is circulating to bring about the breakdown reactions.) These acidotic children, in virtue of their intense physical and emotional reactions, burn up their sugar reserves quickly, so that the fats are insufficiently metabolized; intermediate toxic bodies are formed (ketones) which are acid in reaction, and lead to a diminution of the normal alkali reserve; clinical symptoms of acidosis then tend to obtrude, such as vomiting, joint pains, irritability, postural defects, this condition being often accentuated by parents cutting down the necessary carbohydrate intake provided by sweets, iced cakes, sugar, etc. In this connection the following chart illustrating normal metabolism may be of help, in case the significance of the foregoing has not been fully emphasized.

SCHEME OF METABOLISM

Food intake consists of protein, fat and carbohydrate.

<i>Protein</i>	<i>Carbohydrate</i>	<i>Fats</i>
Used to repair body tissues. (Repair)	Can be readily burnt to form (Energy)	If sufficient carbohydrate present, can be burnt to form (Energy)

In an acidotic child with its rapid reactions, the sugar energy reserves tend to be quickly diminished, more especially if the parents restrict carbohydrate (sometimes on their dentist's advice). Then the following may result:

<i>Protein</i>	<i>Carbohydrate</i>	<i>Fats</i>
As before.	Quickly used up.	Insufficient carbohydrate left, to ensure normal metabolism of fats; intermediate toxic bodies formed, acid in reac- tion.

Clinical Symptoms of Acidosis.—Pallor, irritability in mornings, muscle weakness (resulting in postural defects, with pains in legs and back of neck), abdominal pain, sickness, and smell of acetone in breath in severe cases, while the Rothera test in the urine is positive.

(Comparative photographs of acidotic and lymphatic children were then shown, and then two patients were brought forward for inspection illustrative of either type; the mothers also kindly consented to appear before the meeting, and these showed the hereditary nature of the tendency to abnormality.)

And now, from all that has gone before, I must formulate a very comprehensive conclusion which comprises the whole burden of my remarks. It is *that*



Fig. 1.—The lymphatic types.



Fig. 2.—The lymphatic types.

the lymphatic type of child characterized by a tendency to tissue waterlogging, and by low resistance to infection, manifests coequal with many other stigmata, a tendency to have jaw defects, characterized by mandibular shortening and postnormality, with maxillary narrowing and protrusion. Also that the acidotic



Fig. 3.—The acidotic type.



Fig. 4.—A, The acidotic type; B, the lymphatic type.

type, with its unstable carbohydrate metabolism, will usually have jaws in normal relationship, but possibly with simple and complex irregularities due to crowding. Third, that the normal child, and for that matter the acidotic type as well, may develop one or all of the protrusion defects, but only as a result of bad habits, certain local factors, or by factors of dental heredity, and so on.

Such, then, are my general conclusions, based purely upon clinical and orthodontic observation, but in a mild way I would also try to satisfy those who clamor for statistics, though in this connection I would have you bear in mind Disraeli, who, when pressed for figures by the governors of the Bank of England regarding the purchase of the Suez Canal, told them he could, if need be, make his statistics prove anything!

First, it would be well to enunciate the typical features of the jaw characteristic in a subject showing marked lymphatism.

Maxilla.—(1) Narrowed arch, *especially in the intercanine region.* (2) A tendency for the vault to be high. (3) A tendency for the second permanent molars to erupt in a normal cross-maxillary width.

Mandible.—(1) The total anteroposterior length tends to be subnormal. (2) The existence of "postnormality." (3) Diminished vertical growth in the molar region. (4) Uprising of incisor alveolus causing excessive incisor overbite.

(This is, of course, almost the identical picture painted by Sim Wallace of his conception of the typical Class II jaw, a fact not without interest in that this worker stresses the significance of the "soft sloppy diet" as the main causal factor of the deformity; *in so far as "soft sloppy diets" are essentially carbohydrate in nature*, it is obvious that his view in its entirety can now be challenged on scientific grounds.)

In the children's department of the Dental School of Guy's Hospital, conducted under Mr. F. B. Bull's directorship, some four hundred essentially English children are enjoying active orthodontic treatment, and over these the registrars (Messrs. Cutler and Rix) exercise supervisory care. From the former's group of approximately two hundred cases, were extracted every example which exactly conformed to the type characteristic above described.

The mode of investigation was as follows: during a two-year period from January, 1929, to January, 1931, approximately two hundred children commenced and were still under active treatment; all cases of "protruding maxillary teeth" (patients' symptom) and "Class II, Division 1" (official classification) were then segregated, and of these (approximately ninety in number) sixty remained when the final test of type deformity, before described, was applied. During the normal routine working of the department, further details of these children were secured by means of notes in chart form which were appended to the registrar's duplicate case treatment reports (examples were shown on the screen).

Number:

Name:

Age:

Intelligence	<div> <div>Bright.</div> <div>Normal.</div> <div>Dull.</div> </div>	Judged by personality, response, conversation, care and use of apparatus, etc.
Diathesis	<div> <div>Markedly acidotic type.</div> <div>Not grossly abnormal.</div> <div>Definitely lymphatic.</div> </div>	Judged by clinical examination and by simple chemical and biochemical tests.
Color Type	<div> <div>Dark.</div> <div>Auburn.</div> <div>Fair.</div> </div>	

Many interesting points were discovered (shown on screen), but the following percentages are noteworthy and should be set on record:

- 53 per cent were considered not grossly abnormal.
- 47 per cent showed marked evidence of lymphatism.
- 0 per cent *there were no cases of acidotic type.*
- 70 per cent were fair or auburn haired.
- 30 per cent were dark haired.

Such, then, is my interpretation of one of the greatest problems of etiology which at present confronts us; and as practical orthodontists you must now inevitably be wondering how such conclusions—if correct—can be applied to our own work. Logically, we must first follow the realization that we cannot, solely by appliances of vulcanite and precious metals, erase completely a manifestation of a general disease; the physician must lead the way, and we as technicians must follow. You might well ask, then, what are the lines upon which the physician conducts treatment.

Sunlight, natural or artificial, is considered a most powerful aid, exposure to ultraviolet radiation being facilitated by scanty clothing in the summer months, when the limbs and chest can be freely exposed to the sun's rays; while in the darkness of the winter months the carbon arch has shown its very real value.

Reduction of the carbohydrate intake is very necessary, a high protein and vegetable diet being stressed; while catarrhal infection must be guarded against by appropriate measures. At his discretion the physician employs drug therapy, iron and iodine being mainly employed; Syr. Ferr. Iod. B.P. is a selected standard preparation of this nature, while in certain cases the exhibition of thyroid gland in carefully controlled dosage, brings about a welcome improvement, if acting only as a stoker of the metabolic furnace.

Second, awareness of the significance of the lymphatic state will make us take every opportunity to detect and guard against the development of this specific deformity from the very earliest time, rather than waiting for it to thrust itself upon our reluctant attention at a later and less tractable age.

Third, appreciation of this conception of disease may vitally influence not only the prognosis, but also the very nature of the orthodontic treatment, so that in such cases extraction and simple appliances may ultimately achieve the most satisfactory result; while disappointment will be avoided if no extravagant promises are made with regard to the probable success in treatment of cases coming into this category.

In this sketchy paper I have made no attempt to discuss the actual mechanism which brings about this typical deformity: work on such matters comes strictly within the purview of the embryologist, the comparative anatomist, and the physiologic researcher, and to their findings we must unquestionably adhere. Amateur dabbling in this direction by us can only lead to utter confusion of purpose; rather is our opportunity—as clinicians observing and empirically treating the living organism—to point out to them the line of research, and to indicate the manner in which the various abnormalities appear to be correlated.

The problem of disorderly growth is—like Cerberus of the Underworld—a many-headed monster, one such Heredity, one of the Local Factor, one Diet, and

so on, and we shall not conquer it by random slashes at such apparently vulnerable points, for as in classic mythology, two more will grow in the place of each one destroyed.

The view that mouth-breathing alone is the main cause of this specific deformity is an outworn shibboleth; it is a played-out hack which must vacate the stage, for the scene is set and the audience waiting for greater things. It is abundantly clear that the possibilities of mechanical technic are becoming fully exploited and that we must call the physician, the physiologist, and the clinical researcher to our aid before any real advance can be made. However perfect the results of treatment by expert technicians may be, in the hands of the average practitioner the percentage of failures is sufficiently great often to cause a certain measure of anxiety as to the nature of the result whenever treatment is undertaken. Application of the principles of this new concept of disease will, I firmly believe, not only diminish the percentage of failures, but relieve us of much of the labor necessitated by prolonged and vigorous treatment.

Few will deny the existence of this problem, though many may disagree with my own approach to the matter. A man who takes no advice but his own has a fool for his counselor, while wisdom dwells in the verdict of the company, so that by discussion other and more promising avenues may be opened up, and so benefit accrue to us all.

DISCUSSION

Mr. F. N. Doubleday said that he was always reluctant to take part in a discussion on a subject of which he was very ignorant, but he did believe in the correctness of the principle which Mr. Cutler had enunciated, and he would be sorry if a discussion were not initiated. He thought that the whole problem of the general and constitutional condition of the patients whom they treated was one which had been brought forward in recent years more particularly by the study of glandular therapy and by the biochemists in the study of acidosis and alkalosis, the efficiency of mineral salts, and so forth, and that it was of very great importance. His knowledge of the case so far as it affected children was more limited, but from time to time he had in his practice cases of children, many of whom seemed to conform closely to the lymphatic type of which Mr. Cutler had spoken. For some years he had been in the habit of treating them in part by thyroid gland therapy, and he hoped Mr. Cutler would expatiate a little more widely on that form of treatment in his reply. He had seen patients treated with thyroid gland, in association with physicians who were a little bolder in their treatment than he would care to be, and these patients had developed and overgrown in an alarming manner, and the eruption of the teeth (which was often delayed in this type) had come prominently forward and been exaggerated. Nowadays, he thought, one attached greater importance to the balance of diet than was the case some years ago.

Only that morning he had received a report from the out-patient department at Guy's Hospital which had a bearing on the present discussion. A patient was referred to him by a doctor on January 19 in the belief that he had a neuritis of toxic origin due to dental infection. The patient was sent to the out-patient department at Guy's for the treatment of the teeth. Clinically and radiographically, very little evidence was afforded of anything wrong, but the teeth did show an unusual type of erosion or wear which made him think that the patient was a man of the acidotic type. An investigation of the P_H of the saliva was carried out. He had heard it said that the P_H of the saliva as carried out by dentists was untrustworthy, because the conditions were constantly and rapidly changing. But in this case an acid saliva was found, and to confirm the finding the case was sent to the pathologic department, where it was found that the man had 6.2 P_H of saliva and 5.2 of urine, evidently much on the acid side. In view of this finding, he was referred to the physicians of the

out-patient department, who said that he was suffering from general acidosis, to which the neuritis was attributable. Therefore, although sent to the department originally for the treatment of his teeth, the result of the investigation was that he would undergo a general treatment for acidosis.

Mr. Cale Matthews said that unfortunately he was rather late in arriving at the meeting, and he failed to hear the opening remarks of the author. Possibly he had missed the author's definition of the lymphatic condition. It seemed to him that he had built up a thesis which in one sense might contradict itself. One recognized the type of child; one did not always recognize the condition. From his own clinical experience, he could not agree with the author in what he understood him to convey, that every child with a postnormal occlusion should be regarded as potentially a lymphatic. Further, when it came to the point of treatment, he could not follow the author's idea. He had certainly paid a tribute in the latter part of his paper to the value of orthodontic technic in the treatment of these cases, and that was a point in which, the speaker felt, we in this country were lamentably behind. He thought the paper was extraordinarily interesting; certainly it was interesting to himself, because he was avidly looking for evidence on all these points of diagnosis for very special purposes almost immediately. He was not, however, at the moment prepared to discuss the paper on any scientific basis. On one point a note of warning might rightly be sounded. He thought that dental surgeons might have some primary responsibility for the condition of acidosis. They had preached for years now the withholding of sugar from the diet in many cases, but they had laid this down only in a very empirical manner, and the effects of such withholding might be, he felt sure, disastrous. Unfortunately, he had not been able to hear the discussion which took place in the Odontological Section of the Royal Society of Medicine a week previously, but he had read the paper given on that occasion. In his own experience and in that of many others, this condition of acidosis had led to sea-sickness and similar maladies, and he had conclusively proved to his own satisfaction that the giving of sugar not only would prevent mal de mer, but even in the midst of an attack it would hold it up and conquer it. Therefore the question of the withholding of sugar was a very serious matter in regard to young children, and he thought that dentists should be very careful in their own specialty in the warnings they gave as to the use of sugar. It should only be a certain type of sugar that should be withheld, such forms, namely, as were so extremely sticky that they might damage the dental work which had been done. Sugar should not be withheld in its entirety. He expressed his extreme appreciation of the paper.

Mr. H. E. Marsh said that while thanking Mr. Cutler for his very interesting paper, he would like to ask him whether it was possible for the condition of acidosis to coexist with or supervene very rapidly upon the lymphatic condition. He had in mind a girl whom he had known for many years who exhibited some of the lymphatic characteristics which the author had described. He would say that she very well exemplified what Mr. Cutler had called the waterlogged condition which he had so aptly described. This girl, too, had a lack of eyebrow, and also had the "ironed-out" appearance of the bridge of the nose, and the fold in the chin. None the less, she had normal occlusion, and so far from being dull, she was very intelligent and extremely sensitive—so sensitive, indeed, that she got her parents to change their medical attendant because, in his attempt to be cheery and bright with the child, he had on one occasion called her "Fatty." She had exhibited many of the characteristics seen in acidosis. He believed she might be the subject of thyroid deficiency, or, on the other hand, of too much thyroid—he knew very little about glandular conditions, and he was not sure whether it was thyroid deficiency or too much thyroid which might be the cause of the overgrowth of the soft tissues of the body. But what he wanted to ask was whether the two conditions which the author had described must necessarily be opposed to one another, whether the one must exclude the other, or whether the acidotic condition could supervene upon or arise in a lymphatic condition in the young subject.

Mr. A. L. Packham wished to thank the author for his paper, which, in his opinion, marked a new era in the study of orthodontics. It fell to his lot to see a good many children in the orthodontic department of the Royal Dental Hospital. He thought that he could from memory fairly substantiate the author's experience that a large percentage of the chil-

dren suffering from postnormal occlusion did also suffer from the lymphatic state. The difficulty, perhaps, in getting members to discuss this paper (there had been a lull during which the President called in vain for further discussion) was due to the fact that it came rather as a shock to them, and one would like to be accurate in making such a statement as that. But substantially he could, from his own experience, support the author's remarks. He thought that those members who were also members of the Odontological Section of the Royal Society of Medicine had been fortunate within the last week in hearing, first of all Dr. Osman the previous Monday, who read a most instructive paper, directed mainly toward the acidotic state, while that evening, in this Society, they had listened to another paper directed mainly toward the lymphatic state. There was one further remark he would like to make. It was within the experience of all who had tried to do orthodontic work, that some cases would almost correct themselves, and others, despite all their best endeavors, would not respond to treatment. It might be that if they had looked at these cases from the point of view which the author had suggested that evening, the failures would have been fewer. He thanked Mr. Cutler very heartily for his paper, which must have entailed very many hours of labor in its preparation.

Mrs. Lindsay said that she was very reluctant to speak, but she could not help feeling that the author had selected his cases. All the children with postnormal occlusion were not lymphatic; as was well-known, many very bright acidotic children had mouths showing post-normal occlusion. On the other hand, many lymphatic children had quite normal occlusion. She had been acquainted with a child who was of the lymphatic type up to about the age of twelve years, but she had a perfectly normal occlusion. She was very fat, very pale; to use Mr. Cutler's expression, she was "waterlogged." Then, at that age, she changed over and became very vivacious and quite of the opposite type. She had known children of the acidotic type frequently given to sickness while travelling in trams and trains or when under any excitement, but these children absolutely loathed sugar, and would not take it on any consideration, and they had grown up to be perfectly strong and normal individuals. She thought that it was a pity to dogmatize on these lines. They would remember Kingsley's description of the postnormal child. The child with the V-shaped arch was ranked as the highly intelligent child. She thought it was Sir Charles Tomes who said the opposite, that such children were dull, almost idiotic, and there was a German who had a whole gamut from the dull to the highly intelligent, from the V-shaped arch to the broad arch. It seemed to follow that one could find almost anything one was looking for in these cases, and therefore she thought it was a pity to select them in the way that Mr. Cutler had done. Of course, he had done it very cleverly; he had fitted all his cases into their intended grooves, but those who had to attend and treat these children must take them as they came, and not dogmatize in this manner. She wished to add, however, that she had much appreciated and enjoyed the paper, and she thought it a very valuable contribution to the study of orthodontics.

The President (Mr. A. T. Pitts) said that the paper was full of points of great interest. It was one of those papers which it would not be possible to discuss adequately on a first hearing. But there were certain points which presented themselves and might be brought forward. This was an age in which there was a passion for putting people into pigeon-holes, and a tendency to split up the population according to certain physical or mental characteristics. There was no doubt that the broad classification of physical types which Dr. Hector Cameron had laid down was borne out by general experience. But having formulated a type like that, one had an almost unconscious bias toward making the picture distinct, rounding it off and defining the outlines, as a painter might do. The result was that these particular types seemed to become more and more sharply cut so as to seize and interest the imagination, and he thought that sometimes in the end the classification rather tended to defeat itself. From the standpoint of orthodontists it would be rather a disastrous thing if one generalized backwards from the occlusion, and assumed that the various patients with whom they had to do possessed on this account certain physical or mental characteristics. It would be, indeed, an alarming possibility if a postnormal occlusion came to be regarded as the essential requisite for the future father of a healthy family. Suppose the state were to require a physical examination as a necessity before marriage, and orthodontists were to be called in to take models, and issue, on the basis of the occlusion, a State certificate to the

effect that marriage might be sanctioned! The serious question would then arise as to the unfortunate individual with prenatal occlusion. He rather gathered that perhaps it might be a fair way of putting the case to say that this particular lymphatic type undoubtedly held good of a section of the child population in whom it was often associated with certain dental defects, particularly postnormal occlusion, but that one must not say, conversely, that a case of postnormal occlusion with maxillary protrusion was therefore an example of lymphatism. If one went so far as to say that, one would probably fall into a grave error. But a certain percentage of cases of postnormal occlusion were actually examples of the lymphatic diathesis. That might have quite an important bearing on the prognosis. Everybody who had treated cases of malocclusion for many years acquired a certain prognostic instinct for sizing up those cases which were going to react well and those which were not. With regard to some cases, he felt quite sure that, although he could move teeth here or there, nothing was going to make them remain as they should, and it was possible that the present paper might furnish a certain clue as to what lay behind such cases. Possibly in this type of case, in which the treatment might not be very successful, one might imitate the author and carry out treatment of a very simple type, correcting the maxillary protrusion and leaving the mandible alone.

A point which had struck him was that the well-marked clinical entities in malocclusion were particularly common in hospital and not quite so common in private practice. At the last meeting of the Society he had raised the question as to whether there might be a social grading of malocclusion, and he suggested, without committing himself, that open-bite might show an example of this; the subsequent discussion rather bore out this view. He was rather inclined to think that extreme cases of malocclusion, such as postnormal occlusion, were undoubtedly commoner in hospital practice than in private practice, and that the author's conclusions as to the percentage of postnormal cases showing lymphatism would probably be smaller in private practice. He would like to see some one with the experience of Mr. Visick undertaking an investigation on this point. Mr. Visick had the opportunity at Eastbourne of seeing private patients in good schools—coming from good families—and he would like him to take his postnormal cases and to see how many of them could fairly be fitted into the classification which the author had described. Perhaps at some future meeting Mr. Visick might be able to offer a short communication bearing on that point; other members with exceptional experience might also be able to do the same. Seeing that a good deal of the data had to be obtained from hospital practice, it was rather desirable that the impressions derived from such data should be corrected by those derived from experience of children in a different social position, so as to make quite sure that the conclusions were valid. He thought that the Society was most deeply indebted to Mr. Cutler for his very stimulating paper, for which, in the name of the Society, he offered him their best thanks.

Mr. F. St. J. Steadman supported Mrs. Lindsay's remarks to the effect that extreme caution should be exercised before accepting the view that postnormal occlusion was more common in the lymphatic type of case than in others. Looking back on the cases he had had to deal with he would not be inclined to agree that they bore out Mr. Cutler's teaching. He hesitated about saying anything more definite, as he could only speak from guesswork, and had no actual figures, but his impression was that this type of case did not bear out Mr. Cutler's doctrine that postnormal occlusion was more common in this type. In fact, he had the impression that the dentures in this type were on the whole as good as those seen in any other class of children, but of course it would be necessary to take a large number of these children and examine them carefully before making any hard-and-fast statement. For many years he had been dental surgeon to the West London Hospital, and he had noticed that in this so-called lymphatic type of children ethyl chloride was particularly dangerous as an anesthetic unless given with very great care. He had seen several dangerous conditions arise under this anesthesia.

Mr. R. Ernest Rix asked whether Mr. Cutler would be prepared, in considering the two types, to read into them any differences of racial origin. In the one case, to his own mind, the Nordic type was suggested, and in the other the Latin. The English were obviously themselves a mixed race, and possibly these states were not entirely pathologic, but had a racial significance.

Miss Russell, after saying that the paper had furnished much food for thought to orthodontists, asked why, if it was a general physical defect that they were considering, one should start with the local physical defect first of all. Such a procedure seemed futile. Instead of fitting in plates and appliances, the advice of the medical man should first be asked in the case of a lymphatic child who had postnormal occlusion. On the other hand, she doubted whether that was a correct way of reading the truth of the case. She also thought that Mr. Cutler's classification of the auburn type with the fair type was quite wrong. She had always been taught that the auburn type of person was very much nearer the dark type than the fair, and certainly anything but phlegmatic.

Mr. Cutler, in reply, wished first to remind the members of the chart he had shown, which gave three divisions of cases, namely, the lymphatic, the normal, and the acidotic. He had said that it was a typical manifestation of the lymphatic type to have the characteristics of postnormal occlusion, but he did not exclude the normal child from having them also. They might have arisen from the factors of heredity or early habit. Nor did he necessarily exclude the acidotic type from developing abnormalities. He would never postulate that just because a child had postnormal occlusion it was necessarily lymphatic. That would be a ridiculous statement to make. All that he said was that this type of postnormal occlusion which had been considered that evening was a typical manifestation of the lymphatic state coincident and coequal with many others.

Mr. Doubleday had raised several points. One of these referred to the fascinating subject of glandular therapy. But the administration of ductless gland remedies was about the keenest double-edged weapon that could be imagined. With regard to the thyroid gland, sparseness of the hairs in the outer third of the eyebrow was regarded by physicians as a typical sign of a subthyroidic condition occurring in women at the menopause, and that also was seen in the lymphatic condition. As he had stated, lymphatism did respond to doses of commercial preparations of thyroid gland. He was interested to hear that Mr. Doubleday found that children grew very rapidly when thyroid was administered. That was true to some extent, but he always conceived of the thyroid gland as being a catabolic agent, and, as it were, stoking up the tissues. What were the clinical symptoms of hyperthyroidism? Loss of weight, restlessness, excitability, nervousness—all these were characteristics of hyperthyroidism, and he always looked upon the thyroid as having rather a mechanical action in the treatment of the truly lymphatic type in that it stoked up the body furnace, though no doubt there was a deeper action as well.

In reply to Mr. Cale Matthews, he would repeat that he held that this particular type of postnormal occlusion was a manifestation of lymphatism. As to sugar-withholding, what Mr. Matthews had said was true with regard to children of the acidotic type deprived of sugar, but harmful results could equally be got by means of a too fat diet. The mother of such children, noticing that they were pale and thin, was inclined to give them a fat diet, with plenty of country butter and grade A milk, and so there came about an excess of fat. These children were in a state of chronic acidosis, and by virtue of that condition are most insusceptible to treatment. Such children were inclined to cry, to get annoyed, and to have fits of passion. If, however, their diet were altered, and the fat cut down, their demeanor changed, and they became good-tempered and amenable to dental treatment. He remembered a child seen at Guy's who was very sick while the dresser was taking impressions. The dresser said to him that he feared his impression-taking must be very bad to have that effect on the child. On examining the child he noticed that she had a most marked smell of acetone in the breath, and on altering the diet, cutting down the fats, and pushing on the carbohydrates, she became altogether different, and the orthodontic treatment went smoothly. Therefore, the point raised by Mr. Cale Matthews was of practical importance to those who undertook treatment.

Mr. Marsh had asked whether an acidosis could supervene on the lymphatic state. There were three groups of children, and the greater number were in the more or less normal group. By feeding a normal child on a heavy carbohydrate diet one could eventually produce some of the features of lymphatism, and if a normal healthy child were taken and made to do a lot of exercises, and the sugars in the diet were cut down, he might

show signs of acidosis more quickly than an adult. But that was not to say that the child was an acidotic child. The case cited by Mr. Marsh might be regarded as more or less normal in type, but possibly influenced by such conditions of environment and diets as for the time to show some signs of lymphatism. Later, owing to the lack of sugar, or to pushing up the fats, the condition of acidosis might develop. That was the interpretation he himself would put upon the apparent contradiction. The cases were not necessarily opposed to one another.

Mr. Packham had said that some cases seemed from the first to go badly. That was true, and it was one of the things which had put him on to this conception which he had brought before the Society that evening, that if one applied a more or less standardized treatment to the needs of children in the children's department, certain interesting results were to be obtained. Certainly it was found, on looking through the confidential case reports, that some children reacted very readily, while others obstinately refused to go well. That was one of the first things which put him on to this line of investigation.

Mrs. Lindsay had rather suggested that he had selected his cases. He had taken, as he had stated, a series of two hundred cases; he had taken every case in that series. The case register was open to the inspection of any one at Guy's, and it was possible to examine the models of all those which had this typical condition and no other. Every model, he thought, barring one or two, showed the typical condition, as like as peas in a pod, and all the cases in his list had precisely the same dental deformity. He had tried to get out of any selection by saying that in his list he considered 50 per cent of the cases not markedly abnormal. Some of them, he thought, had a lymphatic tendency, but nevertheless, he had included them in the normal. Then Mrs. Lindsay had put a point that every child with postnormal occlusion was not necessarily lymphatic. But it was not his point at all to say that every child was. Mrs. Lindsay had also made reference to the waterlogged condition as though it meant the same as being very fat. But one could get a fat child who was not waterlogged. Take the case of the Fröhlich syndrome, the anterior pituitary lobe type, and one had at once the "fat boy of Peekham." This boy was not waterlogged, he was fat. The waterlogged type of child was one who could be rapidly reduced in weight by thyroid medication. The fat, not waterlogged, children had flesh which consisted of the normal body tissues, not with any excess of water. That a child was fat did not necessarily mean that the child was waterlogged. Then Mrs. Lindsay said that it was a pity to dogmatize. But as practical orthodontists they had to take up some definite line in some way or other. The argument against them had been that they had a "hit and miss" method. Therefore he thought that a certain dogmatism must be permitted. One should try and divide cases into groups which could be treated by different methods. He considered that dogmatism was of very great value.

The President had spoken of pigeon-holing, and that point bore on prognosis. If he "sensed" a lymphatic type in a child, he had a suspicion that that case would not go too well. With a lymphatic child aged, say eleven years, he would not dream of trying to deal with the mandible by intermaxillary traction, save in the most exceptional conditions; he would try a less radical procedure.

Mr. Steadman rather supported Mrs. Lindsay, and therefore his remarks in reply to her would apply also to the points Mr. Steadman had raised.

Mr. Rix had touched on the question of racial origin, but the speaker had merely based what he had brought forward that evening on clinical observation of English children, with an admixture of Jewish children. It might be asked, What was the percentage of Jewish children who were dark? He did not know at all. That was an instance of how racial characteristics might come into the picture. But he was just dealing with the results of his own investigation of normal English children, and had tried to show how such a study might help the orthodontist materially in his work.

As to the question of auburn children being nearer the dark variety, that might be so or might not. He always found that it was easier to draw the line between the dark child and auburn child than to draw it between the auburn child and the fair child.

A child was either dark or not dark, as a rule, but there might be considerable difference of opinion as to whether a child was fair or auburn. In photographs one could not tell whether a child was fair or auburn, but one could tell whether the child was dark or fair, provided, of course, the photographs had been properly developed and not faked. In his own department the development proceeded under standardized conditions, but it was possible, if one so minded, to make dark children in a photograph appear fair, or fair children appear dark. His own photographs were taken in studios under a standardized technique. The reason why he had classed auburn with fair was because he felt he could get them together, and detect the difference between black and auburn better than he could detect the difference between auburn and fair.

AN APPROACH TO THE TREATMENT OF ADULT DENTOFACIAL DEFORMITIES*

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AS AN introduction to this communication may I suggest that where treatment is requested for adult dentofacial deformity, such deformity is so distressingly obvious that it is possible to obtain a spectacular result. As in normal orthodontics, we must consider not only the relation of the dental arches but also the general facial expression.

I am going to show two cases:

- (1) An underdevelopment of the mandible, or mandibular retrusion aggravated by a slight prominence of the premaxillae.
- (2) Overprominence of the premaxillae or maxillary protrusion.

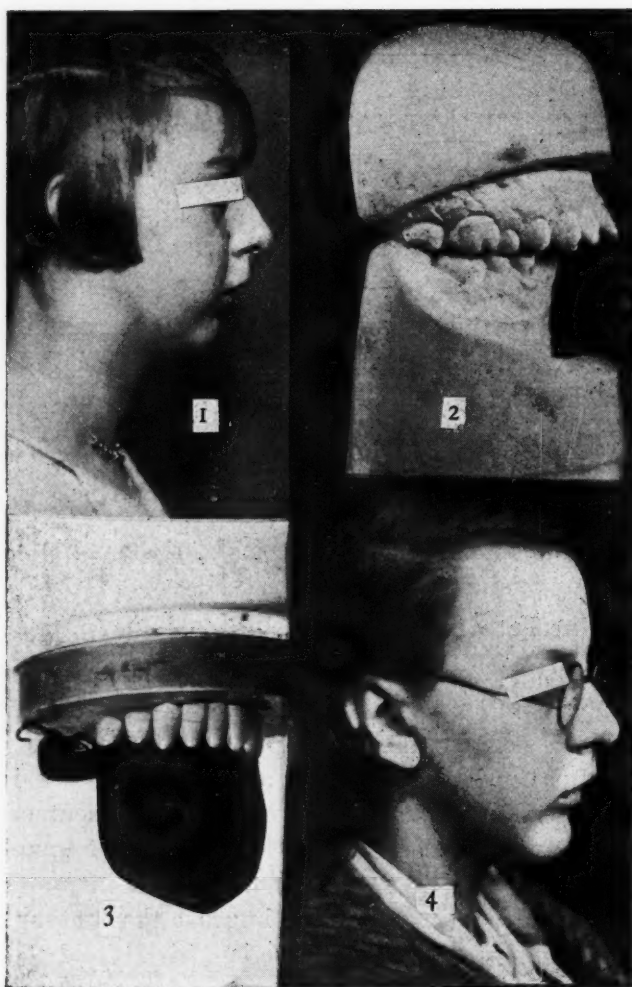
CASE 1.—The patient was examined in October, 1929, aged sixteen years, wearing a maxillary retention appliance. It was ascertained that some form of orthodontics had been performed for the previous three years, and there was still a question of further improvement in appearance and in incision of food. (Figs. 1 and 2.) It was felt that any continued treatment on normal orthodontic lines could not meet with success. Consequently it was decided to refer the case to Sir Harold Gillies in regard to the advisability and the success of plastic surgery combined with prosthesis to improve the contour of the chin and incisive efficiency. Approving this line of action, Sir Harold then explained the suggested treatment to the patient who expressed her willingness to cooperate. Accordingly a lower cap splint was fixed on January 5, 1930. This splint was so made to carry a removable horizontal platform anterior to the mandibular incisors.

Two days later Sir Harold implanted a Thiersch graft from mental foramen to mental foramen, held in position by "Stent." This "Stent" bung was replaced by a gutta percha bung ten days later. One month after this, the gutta percha was replaced by a removable vulcanite bung. At this date the appearance had been considerably improved, and the condition was more or less stable (i. e., the rapid contraction of the surrounding tissue had finished). One year later,

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the mandibular incisors, canines, and premolars were removed. An appliance was then made fitting into the mental trough, and with a view to increasing her incisive efficiency the teeth were placed anterior to the position in which her natural ones had been. (Figs. 3 and 4.)

CASE 2.—In the second case, the patient, aged twenty-six years, was examined on May 2, 1931, when she complained of trouble in a gland in the right inferior mandibular triangle, due to a badly impacted molar. Clinically there



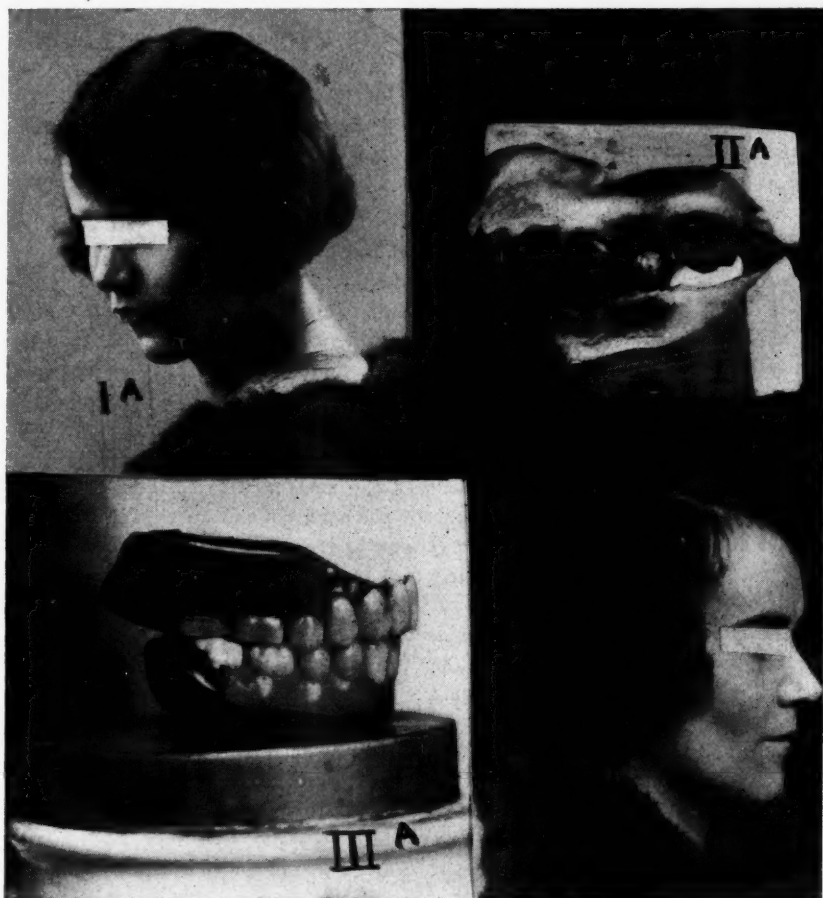
Figs. 1-4.

was a cervical discoloration of the teeth and a general condition of chronic periodontitis, especially in the mandibular incisors. The relationship of the dental arches was clearly one of Class II, Div. 1, Angle's Classification, with an extraordinarily close bite. (Figs. I A and II A.) The teeth and a gross amount of the upper outer anterior alveolar plate, plus a portion of the inner plate, were removed together with the smoothing of the lower alveolus with a bone file, under endotracheal ether. Fourteen days later temporary dentures were inserted, and after five months, permanent dentures were supplied. (Figs. III A and IV A.)

DISCUSSION

Mr. H. C. Visick inquired whether, in the first case, if the patient were asked what she thought of it, she would go through it again. The result had been splendid, but he personally would hate the feeling of that great chunk of vulcanite sunk into his flesh. It had looked to him a most gruesome affair. He congratulated Mr. Walker on his results, especially those which he had obtained in the second case.

A member inquired with what comfort the patient in the first case had worn the apparatus, and how she had used it in mastication; whether it had been stable. He had noticed some wires on the lower plate; presumably the speaker had been using some of the posterior teeth to keep the denture in place. What, he inquired, was going to happen when she lost the



Figs. I-A, II-A, III-A, and IV-A.

back teeth? Would the bottom of the trough take the force of the bite in mastication, or would the denture be kept in place by some other method?

Mr. Chapman said that when he had seen the title of Mr. Walker's communication he had had visions of a description of such adult cases as had been shown under treatment at the Orthodontic Congress: adults who had been treated more or less in the orthodox manner. It had therefore been somewhat of a surprise to hear the actual communication, which had reminded the speaker very much of a patient whose treatment he had undertaken several years before. This patient was a boy of sixteen years, and the procedure adopted had been somewhat the reverse of the treatment in Mr. Walker's case. Resection of the mandible had been advised to overcome the extreme postnormality, and the case was very similar to the one under discussion, but worse; it was important that a good relation of the maxillary and mandibular incisors be brought about. The boy had already lost his four first premolars and the gaps re-

maintained; it seemed that less risk would accrue to the patient if an attempt were made to bring back the six anterior teeth rather than to resect the jaw. The speaker was doing this with intermaxillary force.

Mr. Watkin recalled a case which he had exhibited two years before, of mandibular protrusion. The present case was one of mandibular retrusion. He wondered whether resection of the ramus on each side had been thought of. There would then have been a bony support in front and no denture, and it might have been possible to get good occlusion.

Mr. Cutler remarked that Mr. Walker was the director of the prosthetic department at Guy's Hospital—probably the largest in the country—and was very conversant with the relation of prosthetic surgery and surgical technic to the treatment of these adult facial deformities. In the past the speaker had carefully selected models of some of his more successful cases and very casually shown them to Mr. Walker, indicating the way in which orthodontists kept their patients out of the clutches of the prosthetists. Latterly, however, the process had been reversed, and when Mr. Walker had asked him to come and see the two cases which had just been described, he felt that the Society should at once admit Mr. Walker before his technic had become such as to abolish the need for the services of orthodontists altogether. Mr. Walker had by his methods attempted the alleviation of the main symptoms, the prominence of the maxillary teeth, and the shortening of the mandible. If the two cases were analyzed, the second would appear to be a typical Class II, Division 1, case. The first was not quite typical. The main features were shortness of the mandible from front to back, so that the teeth in the mandible were postnormal to the others; a narrow intercanine space and excessive incisor overlap. If the ideal treatment were undertaken, an effort was made to stimulate anteroposterior growth of the mandible or to bring about a forward bite, in association with the expansion of the maxillary arch and reduction of the maxillary protrusion. In many cases the omens were not favorable, and the practitioner contented himself with alleviation of the main symptom, namely the prominence of the maxillary teeth. As orthodontists, they should do that by taking a pair of teeth out of the maxilla and retracting all those anterior to them. Mr. Walker had followed a precisely similar treatment to that used by orthodontists. In the first case, he had done the ideal thing and increased the anteroposterior length of the mandible; in the second case he had palliated the main deformity of prominence. Many points arose as to the disadvantages of both treatments. One of the most important was the difficulty in the latter of lip control. The speaker produced some photographs of an arch treated on the lines of palliation of main symptoms. The intercanine space had been very narrow. The case had been treated by the removal of a pair of premolars, expansion and elevation of the overbite and retraction of the six front teeth in the manner suggested by Mr. Chapman. It might be thought from the model that the result was very good. It was good from the point of view of the bite, which was improved, but there was a very great shortness; the appearance of toothiness was almost as bad as ever. Gross shortening was apparent in the upper lip, and the appearance was very little improved. The only way to compensate that defect was to bring the lower lip up to the top, which was of course an unnatural posture, and one which relapsed the moment the child was not being observed. Esthetically, therefore, the case must be labelled a failure because of the shortness of the upper lip. The speaker inquired whether, when Mr. Walker left the mandibular incisors, he lifted the lower bite by grinding off some of the tops of the mandibular incisor teeth, so that the denture when inserted was put to less strain. Mr. Cutler also inquired whether Mr. Walker also removed the four maxillary incisors or the canines as well, and whether the canine teeth were given much greater width, thus increasing the intercanine space. The speaker described this work as of boundless promise, especially to general practitioners with a large practice who meet unfavorable cases in the less tractable age periods.

Mr. Walker, in reply to Mr. Visick's question of whether the patient would go through the treatment again, said that the first patient was the daughter of a doctor, so that she had not been going into the whole procedure blindfolded, and her father had possibly exerted some slight influence. She had been sixteen years old when first seen and rather inclined to be a recluse. She was eighteen in the last photograph, and was living a more or less normal life;

she had a circle of friends and was developing generally. The enormous bung of vulcanite did not seem to enter at all into her mind as uncomfortable; as for stability, the speaker added that the lower denture was the most stable that he had ever met. The mandibular incisors could be pushed as hard as possible, and it was actually the anterior aspect of the mandible that took all the strain. The denture did not sink and push the chin further down. The clasps that could be seen on the denture had been fitted because, when the speaker had started the treatment, he had anticipated a difficulty that when the patient started to incise her food the back of the denture would rise. He had, he said, just explained that no such response had occurred, and that the clasps were now entirely unnecessary, but they were there to prevent any sinking that might occur in the permanent denture. He was about to do away with them and substitute short studs coming on to the molars.

Mr. Cutler had wished to know whether four incisors would be removed in certain cases, or the canines. The difficulty, when one merely removed the two centrals and the two laterals, was an unsightly square appearance between the canines, and it was very hard to make any arrangement look moderately natural in these conditions. He would therefore probably favor the removal not only of the canines but also of the premolars. There again he would probably do some slight form of alveolectomy, so as to keep the curve and contour of the upper anterior alveolar crest.

DEFICIENCY OF TEETH*

J. LEWIN PAYNE, O.B.E., L.D.S., L.R.C.P., M.R.C.S., ENGLAND

THE case here recorded is one of a young woman, aged twenty-four years, who came to see me complaining of the spacing and irregularity of her teeth and asking whether anything could be done to improve her appearance. Born in the Argentine, she was a small, ill-developed young woman, who had married an Englishman.

On examination, I found the following teeth in the mouth:

Space of 4 mm. (Fig. 1.)													
3 cusps only											3 cusps only		
6	5	4	c	b	1		1	b	c	4	5	6	
6	5	4	c	2	a		.	2	c	4	5	6	
4 cusps (carious D. T.)											4 cusps (occlusal filling)		

The radiographs were taken by a radiologist who was a friend of the patient, but I regret to say that they are not so complete nor so clear as one would wish them to be. They are clear enough, however, to show that there were no signs of any unerupted teeth lying buried in the jaw and the patient declared that she had not had any extracted. She had only lost those deciduous teeth which fell out without operative assistance.

The special points of interest in this case to which I should like to draw attention are:

(1) The absence of $\begin{array}{cc} 8 & 7 \\ 8 & 7 \end{array}$ $\begin{array}{cc} 3 & 2 \\ 3 & 1 \end{array}$ $\begin{array}{cc} 2 & 3 \\ 1 & 3 \end{array}$ $\begin{array}{cc} 7 & 8 \\ 7 & 8 \end{array}$ that is to say, exactly half the teeth of the normal permanent series are missing.

*Transactions of British Society for the Study of Orthodontics, 1931.

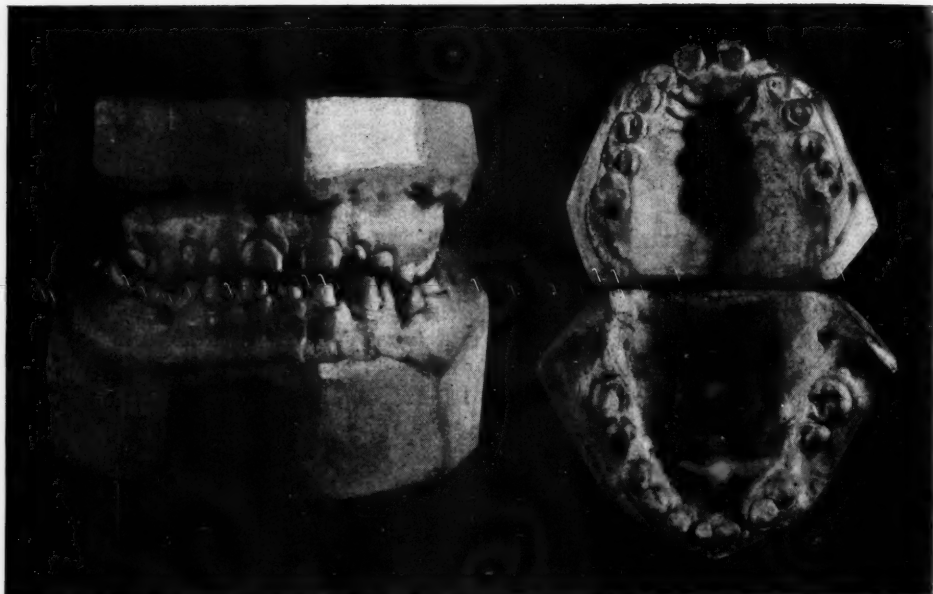


Fig. 1.—The photographer has shown an open-bite. Actually the incisors were in edge-to-edge occlusion.



Fig. 2.—Right.

(2) The fact that the second premolars (which are frequently absent when there is a deficiency of teeth) are all present. Yet the permanent canines, which (with the first molars) are usually considered to be the most constant teeth of the permanent dentition, could not be traced.

It would be possible to argue that the teeth I call first permanent molars should be designated as second molars. For, in the mandible these teeth have only four cusps and in the maxilla there are only three well-formed cusps. But, the constancy of the first permanent molars, the position of the teeth, and the nature of the roots are to my mind ample evidence that they are first molar teeth.



Fig. 3.—Left.

The right mandibular molar was badly carious and a "dead" tooth. There is a marked interspace between the maxillary central incisors measuring 4 mm., and between the two mandibular premolars on the left side a space of $7\frac{1}{2}$ mm., while on the right side of the mandible the interspace between the premolars measures $3\frac{1}{2}$ mm.

It is interesting to note, when a deficiency of molars occurs, the frequency with which the second premolar travels back toward the molar region while the first premolar remains tight against the canine. I have always felt that the relationship of the mental foramen to these teeth may play a part in this arrangement.

The question may be asked, why should the development of permanent teeth be partially or completely suppressed? I fear that I cannot offer any clear solution to this problem.

Among the various causes given in the textbooks for the absence of teeth one may mention: (1) failure to erupt due to impaction, or to a total displacement of the formed tooth; (2) injury, or death, of a developing tooth from trauma or sepsis; (3) transformation of the tooth germ to an odontome (neither of the above applies in the present case); (4) congenital absence of the requisite tooth germ; (5) failure of the tooth germ to calcify.

The fact that some teeth are more regularly missing from the series than others has been suggested as an argument in support of the view that evolutionary changes are taking place which will lead ultimately to a reduction in the number of teeth in the human jaws. But then, against this theory, it may be shown that an excess beyond the normal number of human teeth is more common than a deficiency. Probably both are evolutionary changes illustrative of the uni-

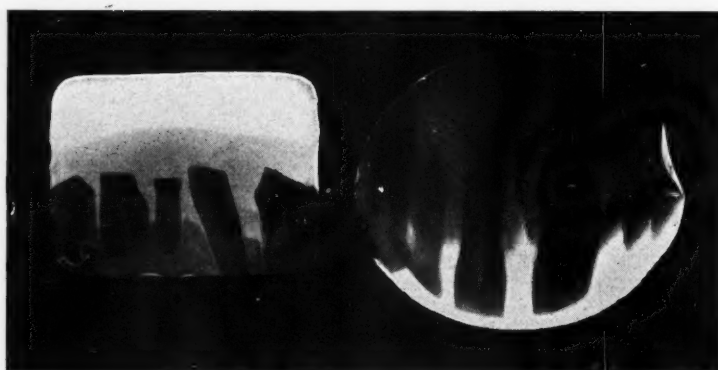


Fig. 4.

Fig. 5.

Fig. 4.—Mandibular lateral incisors and deciduous right central.

Fig. 5.—Maxillary central incisors and deciduous laterals.

versal tendency for variations to occur and that neither of these variations (excess or diminution) in the number of teeth is of any material advantage to the human race.

DISCUSSION

Mr. Carl Schelling inquired whether any authority had yet tabulated these deficiencies, which seemed to be very scarce. He had during the previous week seen a young woman, whom he had known ever since she was a child; she had in the maxilla only two central incisors, the two canines and two molars. He was sure that she had never had any teeth extracted. The remaining teeth were very good. He asked further into what category the deficiencies fell which had been described by Mr. Payne.

Mr. Harold Chapman remarked that in the previous week he had received some models from the Argentine of the dentition of a boy of about sixteen years of age who possessed no mandibular permanent central incisors, but one deciduous mandibular central incisor in a condition very similar to that described by Mr. Payne. As far as he knew, the boy had no other teeth missing. He recalled a case of considerable deficiency of teeth somewhat similar to the one shown: two maxillary and mandibular molars, one on each side, which had erupted, much resembled those in Mr. Payne's case. The academic question arose of whether they were first molars; from the occlusal surface it did not appear that they were. He would be glad of Mr. Payne's opinion of whether they were first or second molars.

Mr. A. L. Packham asked Mr. Payne to describe more fully the general condition of the patient, and especially that of the hair, eyes and general skeletal development. Many members present would remember that Mr. Payne had read a most interesting paper upon the subject about two years previously under the title of "Cranio-cleido-dysostosis," and the present case, if it had occurred earlier, might have been included in the series which the lecturer had then shown. The speaker recalled the demonstration to the society some years previously a case of asymmetrical absence or nondevelopment of teeth in a girl aged twelve years; on one side the canine had been absent and on the other the first premolar. It had struck him at the time that this was a very curious and rare condition owing to its asymmetry.

Miss K. C. Smyth requested the lecturer to say a little more about the second premolar, and to suggest why it, and not the first, should have moved back in the mandible. He had mentioned the position of the mental foramen as a factor influencing the movement: in what way did he think it could act? The speaker mentioned that she had seen first premolars tilt backward, and inquired whether the lecturer considered that in that case the root was stopped by the presence of the compact bone lining the mental foramen, and whether the tooth then inclined, with the mental foramen, or rather the bony canal leading from the foramen, as a fulcrum.

The President stated that he had always been interested in cases of suppression of teeth, largely because so little was known about them and because they offered such a tremendous field for speculation. He had seen a considerable number, and several of a degree even more extensive than that described by Mr. Payne. He considered that the absence of teeth fell into two groups: one in which certain teeth tended to be absent, the characteristic ones being the laterals, the third molars and the second premolars; and the other, of which the present case appeared to be an example, in which there was a deficiency of all or of a considerable number of the teeth. Mr. Packham had anticipated him in inquiring about other factors. When a considerable number of the teeth were absent, the deficiency was no doubt one of the expressions of what had been called the combined major ectodermal defect, and in nearly all cases in his experience it coincided with other abnormalities of the skin, hair, sweat glands and nails. He had seen three cases of this combination in children: one had been a boy who had had a small face with a wizened expression rather like that of an old man, with small jaws, in which the x-ray pictures had shown that two teeth only were present, which by the irony of fate had been situated respectively in the left maxilla and in the right mandible. There never had been any other teeth and there were not going to be any more. The skin had been dry and harsh and the hair short and scanty and very slow growing; the mother had said that the boy never perspired at all.

Another case had been that of a boy who was a little better off, for he had had five or six rather ill-formed, peg-shaped teeth; he also had abnormalities of the skin and hair. The third case he had observed in one of the wards at Great Ormond Street; the patient had exhibited a very marked deficiency, having only three or four teeth present in the jaw according to the x-ray pictures. In this case also the skin had been dry and harsh. He, the president, had read that in Germany it had been discovered that such cases often led to an absence of sweat glands, so he had asked the house surgeon whether a biopsy could be performed to ascertain whether this deficiency was present; the investigation had been carried out and it had been found that sweat glands were absent in the skin.

Deficiencies were not necessarily present in all the structures: the skin, hair and teeth might be affected and not the nails; or the hair and nails and not the eyes; or the skin, hair and sweat glands might be affected while the teeth remained normal. Nevertheless, all the cases had in common a quite definite defect in development of the ectodermal layer, and it was proper to consider them all as failures of the ectodermal cells to develop. Many cases had been recorded, but often from the point of view of their salient features; a good many, for instance, had been recorded by dermatologists, who had described abnormalities of the skin and nails; some by pediatricists in their transactions; and the dental aspects often tended to be overlooked. If, however, the literature was ransacked, it was surprising how large was the number of cases of this sort that had been recorded. Some worker ought to collect them from all points of view, and then the orthodontist would be able to acquire knowledge of them.

With reference to Mr. Packham's remarks, the president doubted whether the cases that Mr. Payne had recorded at the meeting of the British Society for the Study of Orthodontics in February, 1929, were examples of a similar condition. He suggested that they were cases of cranio-cleido-dysostosis, since the teeth were present and had failed to erupt. About two years before, he had seen a case in which the teeth had all been present, but many of them had not erupted. Since it might be assumed that eruption was a function of the alveolar bone, as demonstrated by Prof. Brash, it appeared that these cases were not an example of an ectodermal, but rather of a mesodermal defect.

Turning to the absence of lateral incisors, second premolars, and third molars, the president remarked that he had always felt that the atavistic explanation, or the theory that the human race was undergoing evolutionary changes, and that in the course of time its dental formula would decrease, was rather hard to follow and constituted somewhat of a strain on the imagination. It was possible that, some hundreds of thousands of years to come, the presence of a lateral incisor would be regarded as an abnormality by the dentists of the day and recorded in the proceedings of some orthodontic society of that time.

In considering the factors governing the selection of these particular teeth for deficiency, it had struck him that the lateral was situated in the neighborhood of the maxillopremaxillary suture. There might be some interruption in the continuity of the tooth band: it would seem that the appearance of the toothband and the joining-up of the premaxilla and maxilla occurred close together, and one might happen before the other. It was quite a possibility that some abnormal stress or strain in that region might easily interfere with the tooth band and lead to the suppression of the lateral incisor. In the third molar we had the end of the tooth band, which terminated in the region where there was a sort of struggle between the ascending ramus and the body of the jaw. There was a definite tendency for the jaw to become shorter, and the end of the tooth band in that region might be interfered with. There were therefore two regions in which considerable stress or strain occurred which might account for the absence of teeth formed in these two areas.

When, however, he tried to link up the second premolar in the same way and speculate why that tooth should be so often absent, he confessed that he was somewhat baffled. Nevertheless, he suggested that some of these cases might be due to injury at the time of the extraction of the second deciduous molar, or to infection. He had seen cases where, although no attempt at violence had been made, the extraction of the deciduous molar had brought the tooth germ away with it. On the other hand, there were many cases in which the second deciduous molar had been a firmly implanted tooth in adult life and there had been no sign of the premolar. He could not, however, think of any particular factor which might cause the second premolar to be absent, except that it had occurred to him that it was in the region of the mental foramen, where ossification of the mandible began and where some abnormality in the process of ossification might lead to a disturbance of tooth development at that point.

Concerning the possibility of compiling a pedigree of this deficiency, the president said that he had read in the *Lancet* a notice that the Eugenic Society had published a small pamphlet on how to construct a pedigree. This might be a very useful aid in many cases of inheritance of abnormalities of the teeth and jaws.

Mrs. L. Lindsay described the president's remarks on the lateral incisor as somewhat alarming, if Mr. Kelsey Fry were correct in his suggestion that, when the lateral was suppressed, the children of such a person would have cleft palate. Did the speaker suggest that such a disfigurement would occur in all the descendants of persons with suppression of the lateral incisor?

The President declared that he was not going to say anything of the sort. Mr. Kelsey Fry had referred to the statement by Lucas fifty or sixty years before, which had been explored by many clinicians and had not been supported by any evidence.

Mr. H. G. Watkin stated that he had encountered several similar cases, and inquired what treatment Mr. Payne proposed—or was carrying out.

Mr. Robert Cutler expressed the opinion that the case, extreme though it might be, was not only of great academic interest, but also susceptible of the most practical application. It

must be, he said, within the experience of all the members present to be abruptly faced with the realities of the suppression of teeth in the second dentition. They could all remember cases which they had had under treatment in which the unsuspected absence of certain of the permanent teeth became ultimately disclosed, so that the final mechanical results which they had had in mind might be endangered, while their belated explanations to the parents often spoke ill of their prescience. Mr. Payne had indicated the maxillary lateral incisors as those which were very frequently absent, and the pair which had the greatest significance to practical orthodontists. It might be extremely interesting to test the opinion of members on the points of the conditions—the signs and symptoms for which they looked to indicate to them the possibility of absence of the maxillary lateral incisor teeth. It was not given to all orthodontists to be able to take routine x-ray pictures of every case they treated. They usually had to reserve the x-ray for those cases in which there were special indications. As far as the maxillary lateral incisors were concerned, the speaker thought that there were some very definite indications, at least for an x-ray picture. Those which suggested themselves immediately were, first of all, delay in the eruption of the lateral incisors beyond the normal age period: correlated with that, an undue firmness of the deciduous lateral incisors. Second, it was necessary to look for a lack of the normal fulness of the alveolar bone in that region, and third, the practitioner should inquire for a history of any parental suppression or deformity of the lateral teeth. Fourth, there was a point which he put forward in all diffidence, because it might be contradicted: a jaw which was apparently crowded—that in which the practitioner saw the maxillary deciduous intercanine space to be narrow, and in which the central incisors had already erupted. In a case in which the central incisors had erupted and there was a narrow intercanine space, so that there would not be room for adult laterals, if those central incisors were free from any rotation at all, there was a very great possibility that the laterals were absent. That alone was a strong indication for x-ray pictures. If all four teeth were there, the practitioner would certainly see some degree of torsion of the central incisors.

Logically, the question of treatment should be approached in the following way: if a pair of maxillary lateral incisors was missing, should a pair be removed from the mandible to keep the case in balance, or should the practitioner merely watch the case over a period of years and see how it developed? They all knew the bad results that followed from the extraction of one isolated irregular incisor tooth from the mandible during the growth period, three to eleven years. If treatment were attempted afterward, it seemed rarely possible to make the jaws fit.

Mr. Payne, in reply, stated that the young woman whose case he had described was a small woman of twenty-four possessing a rough skin, sallow complexion, and excessively dark coarse hair which, however, was plentiful. She had brown eyes, a small face, but the jaws appeared to be normal in form. He agreed with what the president had said concerning the suggested connection of cases of cranio-cleido-dysostosis with the present case. There was no real relationship. In cases of cranio-cleido-dysostosis the teeth were developed but were delayed in their eruption, and in nearly every case the number of teeth was at least equal to normal, and many patients possessed a number in excess of the normal. At any rate, this applied to the cases which he had had the opportunity of examining. There was much to be said for the president's view that the case which he had shown that evening represented an ectodermal defect, while examples of cranio-cleido-dysostosis pointed to mesodermal defects.

In reply to Miss Smyth's question, concerning the movement backward of the second premolar while the first premolar remained in position, he had suggested in his communication that the relationship of the mental foramen to these teeth might have some bearing upon the matter. He thought that possibly the vascularity of the region, and the fact that it contained the original center of ossification, might have an influence upon the movement of these two teeth apart, which was so common. The first premolar was nearly always retained against the canine, whereas in some cases the second premolar would move back even more than it had done in the example he had described.

Referring to Mr. Chapman's first case, the speaker said it was a curious coincidence that both the patients should come from the Argentine. He could not say whether it was possible to trace other abnormalities of the same nature to that country. With regard to Mr. Chap-

man's second case, it was difficult to come to a definite conclusion without seeing the patient and the x-ray pictures, but the chances were greatly in favor of the teeth being first molars.

Mr. Schelling had suggested that these cases should be tabulated. For this purpose they must be recorded. That had been the speaker's reason for bringing this communication forward. He felt that every case of deficiency should be recorded so that a sufficient number for tabulation might be accumulated. Research workers then might be enabled to come to some conclusion as to the causation.

In reply to Mr. Watkin, he stated that his treatment might be considered unorthodox. He had decided to extract the ugly-looking front teeth together with the carious mandibular first molar. Dentures were fitted subsequently, and he had reason to believe that the patient was much more pleased with them than she had been with her own teeth.

CASES IN PRACTICE

D. S. HAYTON-WILLIAMS, L.D.S., ENGLAND

I HAVE chosen for casual communication two cases treated with the ribbon arch. The use or mere mention of the ribbon arch, I know, is sufficient cause for my excommunication in the eyes of some. But I am anticipating.

CASE 1.—Patient, aged twelve and one-half years, is a small, physically underdeveloped girl—the remainder of the family are well built and normal with very sound, regular teeth. Her general condition has been somewhat of a problem to more than one child specialist. However, her main handicap is her mother, who insists, in her hearing, that the child is nervous and always will be.

In Fig. 1 models dated 30/7/30, note crowded mouth, rotated incisors. The child brings her mandible forward to find a bit of convenience; 6 | is missing, having been extracted prior to my supervision. Numbers of deciduous tooth roots are present.

Treatment.—Radiographs were made to ascertain the presence and position of premolars and the maxillary left lateral. I then extracted the roots and also the four deciduous canines with the idea of temporarily relieving the crowding and with the intention of extracting a permanent tooth or teeth at a later date.

Anchor bands were cemented to the first molars, and a ribbon arch was applied with lock pins to brackets on pinch bands on the permanent maxillary incisors. This was on for six months, the arch being rebent when necessary, and corrected the rotation of the incisors without any forward movement of the teeth. They were slightly separated, however, and were approximated with a simple nut and bolt appliance. A bite plate was also inserted at the latter stage on which the mandibular incisors impinged to open the bite.

Fig. 1, models dated 29/7/31. Nearly exactly a year since I first saw the child. These models indicate very much what the state of the teeth is today. The patient is now wearing pinch bands soldered together on the maxillary incisors for retention and a bite plate with wires to guide 4 | to position and prevent 4 from moving anteriorly.

These are some of the difficulties and points of interest I found with the case.

1. The absence of $\overline{6}$ and the instability of $\overline{TM2}$ prevented me from correcting the rotation of the mandibular incisors. They have been corrected, however, to some extent naturally, and by the child applying digital torsion to them.

2. The false appearance, originally, of a Class III case owing to the awkward position of the maxillary and mandibular incisors.

3. The unusual order of eruption of the teeth. In the maxilla the $\underline{2}$ had not erupted, while $\underline{5|5}$ had erupted prior to $\underline{4|4}$.

In the mandible, $\overline{2}$ had not erupted, while $\overline{4}$ had, and $\overline{4}$ had not.

It is now a case of hanging fire until more teeth erupt. Her doctor has prescribed cod liver oil, as he thinks this may accelerate eruption of the teeth.

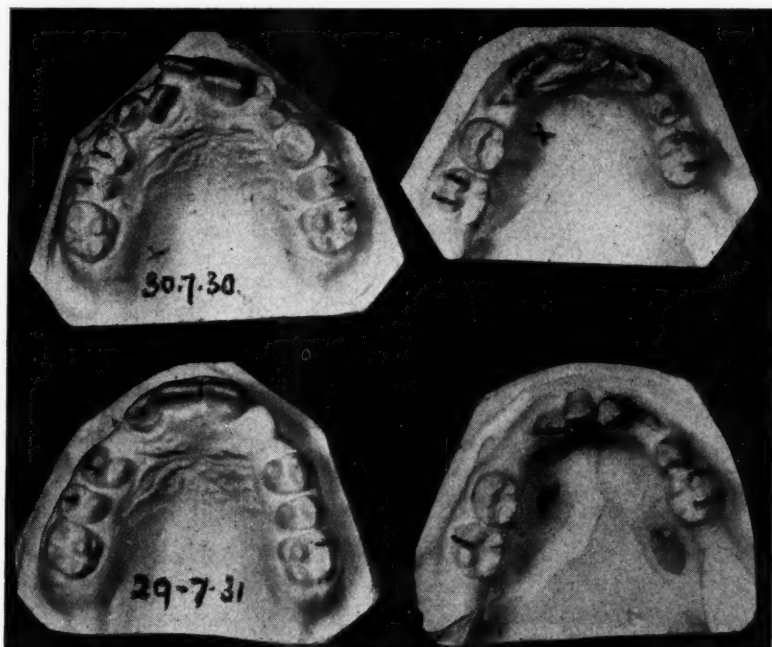


Fig. 1.

I have not yet definitely decided whether some extraction of permanent teeth may not be necessary eventually, as I have to bear in mind the small and frail physical build of the child, and the last thing I wish her to have is a mouth giving the impression of an arcade of teeth.

CASE 2.—Patient is a girl, aged eleven years and seven months, is of normal size and suffering no known ailment of any description. The family, generally, have very large teeth.

In Fig. 2 models dated 24/3/30 show the condition of the mouth when I first saw the child. X-ray pictures were taken for premolars, and I found all present. There is nothing peculiar about the radiographs, so I am not showing them.

I decided to extract both maxillary and mandibular deciduous canines (preparatory to extraction of permanent teeth later on) and wait a few months to

see if any natural alignment of the incisors would occur. About four months later there was some very slight alteration for the good.

I decided to expand the maxilla with a plate and also to extract $4|4$ as I felt expansion alone would not make sufficient room. In addition a ribbon arch was applied to $21|12$ with anchor bands on TM2's. The ribbon arch was sliding freely in the tubes, but I could see that while the rotation of the incisors was being corrected there was a very distinct and steady forward movement of them. I could think of nothing, however, to check this and despite careful rebending of the arch it continued.

Having corrected the rotation, I now retracted the maxillary incisors, keeping the pinch bands on the central incisors with wire projections to the laterals

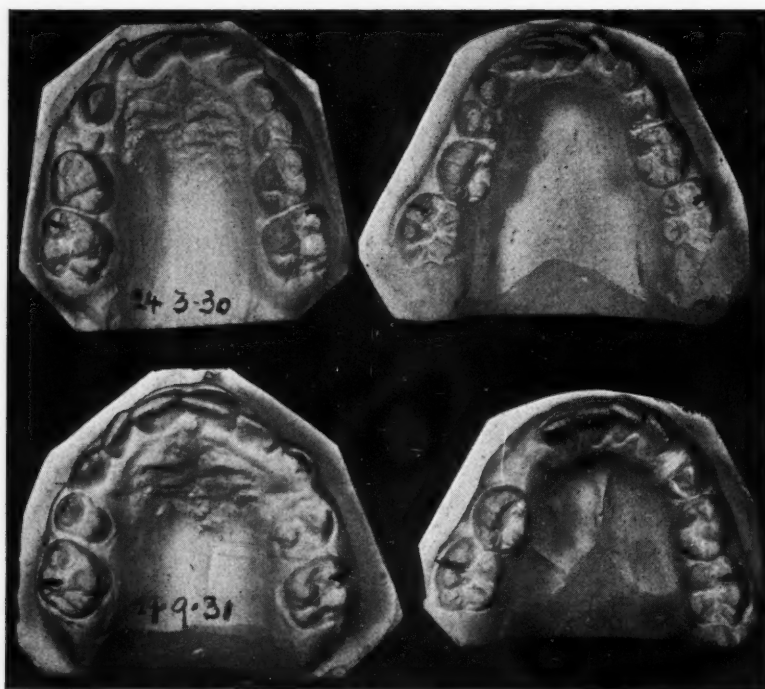


Fig. 2.

to prevent a reversion to the rotated state. After expanding and retracting simultaneously for three months, I removed the pinch bands and had everything all but in position when the patient became very slack in wearing her plate. She had not worn it for a week and naturally it was useless. A new one was made, a few days elapsing. By this time the incisors had started to revert, but I attempted to correct this by "kinking" the arch and allowing it to bear on the projecting angles of the teeth.

I was still further handicapped by an outbreak of mumps at her home, precluding visits to me. About a month ago also there was an outbreak of measles at home—a further hindrance. I do not suppose I am alone in finding these interruptions occurring at the most inopportune moment.

Regarding the outstanding mandibular 6's I did not use any appliance, but stoned the cusps to prevent any exaggerated interlock and felt they might find their position with the expanded maxillary 6's $\frac{6}{6}$ have done so, but $\overline{6}$ is still buccal to $\underline{6}$. I shall not correct this in view of the uncertainty of cooperation from the patient and her mother.

The latest models are those dated 29/9/31.

The maxillary arch is considerably broader than the original, and the rotation of the incisors has been practically corrected. When canines and second premolars are erupted, there will be no intervals between the maxillary teeth.

The mandibular incisors, it will be noted, have become aligned without any appliance. I am going to extract the mandibular 4's soon and this with retention of the maxillary will complete treatment, since, as I have explained, I am not assured of cooperation from patient and mother, particularly so since the mother is quite content with the present state of things.

The point on which I should very much welcome enlightenment is whether maxillary incisors do not always come forward even with reciprocal force if a number of teeth have to be rotated, since, assuming the ribbon arch to be running freely in the buccal tubes there is a greater tendency for the incisors to move labially than palatally, particularly in a case such as this where the maxillary front teeth had all to be rotated in the same direction, i. e., clockwise.

DISCUSSION

Mr. R. E. Rix remarked that the inclination of the maxillary incisors which had worried *Mr. Hayton-Williams* could be explained, he thought, fairly easily. In forcing those incisors into alignment, since their mesial distal line was at the greatest, they must perforce move laterally, unless some means were taken to move the laterals distally at the same time. He thought that in treatment, room should first of all be found for the alignment of the incisors before such alignment was proceeded with. It was desirable not to lead them into alignment before having made room for them.

Mr. Robert Cutler said the first case with which *Mr. Williams* had dealt was one in which he had conducted some orthodontic treatment of the maxilla by means of a ribbon arch and had then put in an anterior biting plate to alleviate the close bite. He had stated that he had some difficulty in securing alignment of the mandibular incisors, seeing that the six-year-old molar was lost and the second deciduous molar on that side was loose. The speaker would suggest that in a case like that it might have been advisable to have made the biting plane in the form of a very sharp incline in the maxilla, so that if the plate was worn at mealtimes the irregular margins of the mandibular incisor teeth would impinge upon it and the teeth would become automatically aligned. He showed in this connection a standard chart as used in *Guy's Dental School*. Such a procedure would accomplish the two results of alleviating the overbite and bringing about the alignment of the mandibular incisors without the need of any subsidiary appliance. In the second case *Mr. Williams* had described how he brought about alignment of the anterior teeth after he had conducted expansion, and he then stressed the tendency to relapse which occurred when the apparatus was inadvertently left out for some little while. That was particularly true in those cases in which one endeavored to get a straightening of the travel without expanding the arch at the same time. Where rotated incisors were present in an arch which was crowded, if one could expand that arch and at the same time bring about straightening of the incisors during the time that expansion was going on, provided, of course, that the expansion had been consonant with the normal growth processes, then the plate could be abandoned at any time, and no relapse would occur. On the other hand, he might take a case in which most of the deciduous molars were lost, so that expansion by a

plate was impossible; in such a case the tendency to relapse would be evident. Here the speaker showed another chart illustrating the crowded arch with rotated incisors, where, by means of the wearing of the upper Badcock expansion alignment appliance, as expansion proceeded, one obtained a spontaneous and complete alignment of the anterior teeth. Provided the expansion had been carried out at the correct moment, one could take out the plate and no relapse ever occur. That, of course, was conditional upon the expansion being carried out in the proper manner. If one was not able to expand under the physiologic correct conditions, the tendency to relapse was perfectly appalling.

Mr. H. G. Watkin asked Mr. Williams what was the condition of the lips in these cases. He thought that the permanency or otherwise of the result would depend to a great extent on the position of the lower lip.

The *President* asked whether, in cases in which there was reluctance to erupt, Mr. Williams had thought of using small doses of thyroid extract. This did speed up the metabolism generally.

Mrs. Lindsay suggested in cases of tardy eruption something less complicated than thyroid extract might be employed, namely percussion, with an automatic mallet and India rubber point. The India rubber stopper from the tubes of novocain tablets fitted on the point of the mallet were the most handy instruments to percuss over the parts of the jaw where the tooth should erupt.

Mr. Hayton-Williams, in reply, said that Mr. Rix had suggested that room should be provided before any attempt at alignment was made. In both the cases he had brought forward he *had* room in which to align the maxillary incisors. In the second case he had already extracted the deciduous canines before attempting alignment. Mr. Cutler had suggested the sharp inclined plane to align the mandibular incisors. That was a helpful suggestion, which had not occurred to him. Mr. Cutler had also said that it was essential to have expansion at the same time as reaction. But in the cases he had brought forward the expansion was only in the cheek teeth, not in the front teeth. In reply to Mr. Watkin's question about the lips, in each case the patient could bring the lips together quite normally. He would pass on the President's suggestion about thyroid to the family advisers, and he was grateful also for Mrs. Lindsay's suggestion about percussion.

A CASE OF IMMEDIATE TORSION INVOLVING SECONDARY TREATMENT*

F. BOCQUET BULL, M.R.C.S., L.R.C.P., L.D.S., ENGLAND

IN 1921 I read a paper before this society on "The Immediate Torsion of Incisor Teeth," in which I described the method for rotation of incisor teeth by means of forceps under an anesthetic, and showed that to be successful it was necessary for the tooth to have an apical foramen which was still open. I further showed by means of films that in those cases where the foramen was an open one the tooth went on developing after rotation.

Now, it is obvious that in the cases which lend themselves to this method, apart from the position of rotation, the tooth may be fully or only partially erupted. In the majority of cases the teeth are fully erupted, and therefore the only movement to be imparted is one of rotation. Very rarely the tooth is only partially erupted. Under these circumstances rotation can be employed, but with the probability that at a later stage it will be necessary to draw the tooth into position.

It is obviously impossible to draw the tooth down to its correct alignment when rotating, for the tooth would lose all connection with its socket, and now I should like to show the case of a partially erupted and rotated incisor to which immediate torsion was applied about four years ago. I regret that the original models have been mislaid, but the original film will show the position of the tooth.

The tooth was rotated and splinted in the ordinary way and remained vital (Fig. 1).

At a later period the splint was removed, and the patient was not heard of until July, 1929, about eighteen months ago, when she presented herself again. The tooth was still vital, and x-ray pictures showed a normal root and apex.

The secondary treatment that the case involved I shall now describe. A critical examination of the position of the teeth on the side of the maxilla in question showed the following points:

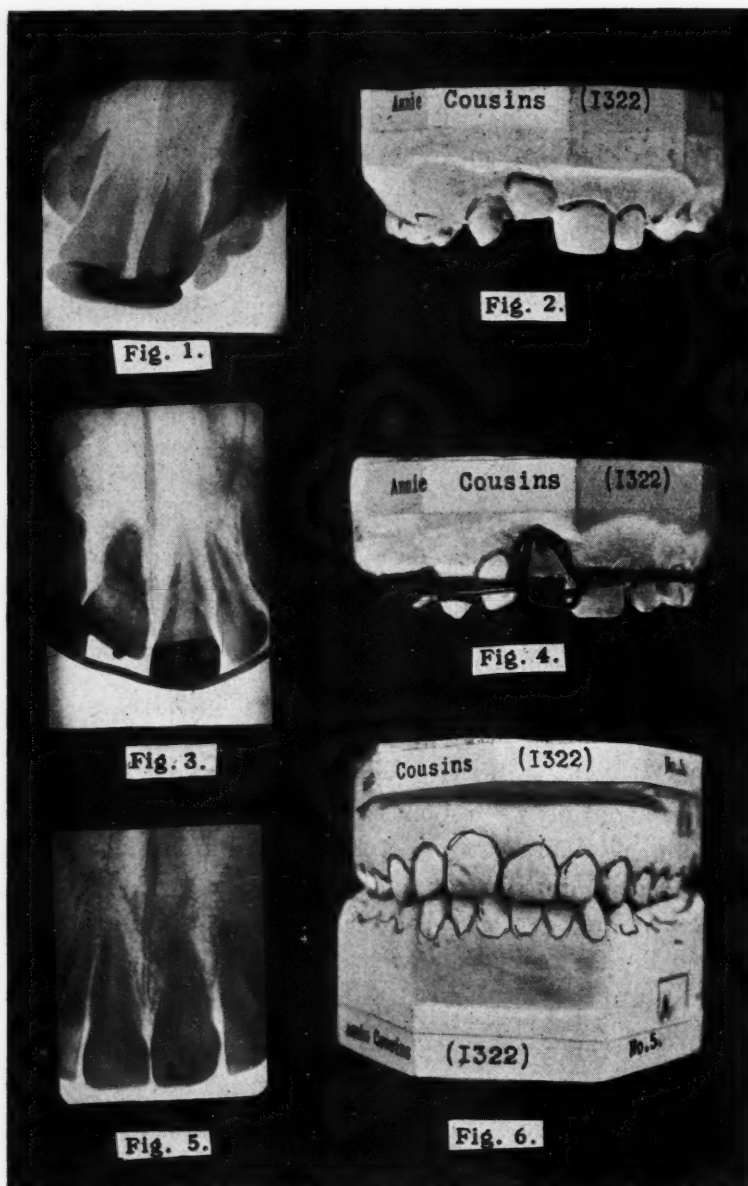
- (1) Lack of eruption of 1 |
- (2) Mesioversion of 2 |
- (3) Crowding of 4 3 | region. (Fig. 2.)

The treatment consisted of the extraction of the first premolar. The enamel of 1 | was exposed in the cervical region under a local anesthetic, and a small pin hook was inserted in a hole drilled in the labiocervical region. A fixed arch was applied to retract the canine, to rotate and retract the lateral, and for retraction on the partially erupted central. This apparatus was fixed in August, 1929. In October, 1929, the case note report states that the downward movement had been only slight, although the force was efficiently applied. It was not until a month

*Transactions of the British Society for the Study of Orthodontics.

later that gradual downward movement became really manifest. After that, progress was uneventful until completion, and finally a retention plate was inserted. The cervical hook was retained in the form of a small step to prevent depression of the tooth by incisal force. (Figs. 3 and 4.)

The final x-ray pictures show the apex normal in the new position. Vitality is fully maintained. (Figs. 5 and 6.)



This case is not without interest in showing:

- (1) The reluctance of the tooth to erupt at first under efficient treatment, which suggests that some fibrosis of the periodontal membrane had probably taken place.
- (2) The development of the root after immediate torsion.

- (3) The method used in drawing the tooth into normal position.
- (4) The vitality of the pulp four years after the original operation.

DISCUSSION

Mr. H. G. Watkin asked why *Mr. Bull* had thought it necessary to drill the hole in the tooth and insert a pin; he asked whether a band would not have been sufficient and have done less damage.

Mr. Bull replied that he always found that a pin was somewhat simpler in use and did not do much damage to the teeth; it did not encumber the process of drawing the tooth down, as perhaps a band sometimes did. Moreover, it did not irritate adjacent teeth. The question was one of personal preference.

Mr. H. C. Visick asked whether *Mr. Bull* did not think that his last x-ray photograph showed that the pulp of the tooth that had been moved had undergone some change. The outline of the pulp chamber had seemed to him to be almost obliterated; this was only what might have been expected. He said that he had often seen, in a tooth that had received a blow, the pulp chamber slowly ossify; the tooth finally—perhaps many years afterward—became discolored. It did not become septic, but merely dried up, and the pulp chamber always closed.

Mr. Bull, in reply, regretted that he could not say anything about the discoloration of the tooth, because the series of pictures had been taken four years previously. In the only case he had seen since the end of the treatment, the tooth had appeared perfectly normal and the pulp was undoubtedly vital. There had certainly been some fibrotic change around the root itself which probably obscured a clear view of the pulp canal. If *Mr. Visick* would ask him that question in another ten years' time, he might be able to give a more definite answer.

Mr. A. E. Marsh inquired whether the tests made for the vitality of the pulp had shown any difference between this tooth and its neighbors.

Mr. Bull answered that he had not applied the test in this case, but had in all the others. He suggested that *Mr. R. Cutler*, who had himself performed the test, should answer the question.

Mr. Cutler said that he had tried cold and heat by ethyl chloride and hot gutta percha; the thermal changes had been precisely the same as in the adjoining teeth and of the same intensity. He referred to *Mr. Watkin's* point about the use of a band; he had tried three times to put a band on this tooth, but each time it had come off.

The *President* remarked that this was a very good reason for putting in a stud. He hoped that *Mr. Bull* would be able to keep an eye on this case and take an x-ray film in two or three years' time. He himself had had a case somewhat similar to this. Several years before he had reported to the society a case of a very severe degree of malocclusion in the incisor region caused by two supernumerary teeth; he had rotated the left maxillary central incisor, which had been lying very obliquely and high up. He was unable to say whether the apical foramen had been open, though from the age of the child it was probably closed. The rotation had been done by immediate torsion quite successfully, and later on the tooth had been drawn down into position. He had seen the child at intervals for five or six years afterward, and at the last examination an x-ray picture had shown that there had been a good deal of absorption of the root. Although the tooth had remained a good color and perfectly firm and had reacted to thermal changes, yet the reaction had been perceptibly less than that of the other teeth. The subsequent history of *Mr. Bull's* case ought therefore to be interesting, and he hoped that *Mr. Bull* would be able to report it to the society during the next few years.

DEPARTMENT OF DENTISTRY FOR CHILDREN

THE HUMAN CHIN AND HUMAN TOOTH CHANGE

THOMAS W. COOK, D.D.S., WASHINGTON, D. C.

THE chin is one of the most characteristic structural features of the skull of *Homo sapiens*. Man alone among primates possesses a true forward-projecting chin; and among man and his immediate human forerunners, it is absent in such ancient types as Neanderthal man and Heidelberg man.

To account for the presence of the chin several hypotheses have been put forward. Among these the one first formulated by L. Bolk (1924), but given its chief prominence by the writings of Dr. G. Elliot Smith, is probably more widely known than any other. According to this hypothesis man's chin results chiefly from peculiarities of bony growth that are supposed to result from the slowing down of the process of change from the deciduous dentition to the permanent dentition, as compared with the more even and rapid rate at which this change takes place in man's nearest animal relatives, the great apes. Bolk,¹ thus sets it forth: "The retardation of the molars' eruption is the cause of the prominent chin that is characteristic of *Homo sapiens*, the alveolar part of the mandible forming after the teeth and thus, as the permanent teeth occupy no more space than the deciduous teeth, is checked in its growth, whereas the basal part is not checked but grows forward, whereby the chin projection arises." Dr. G. Elliot Smith²³ enlarges of this theory and introduces the growth of the brain as a modifying factor in jaw development, as follows: "In the evolution of man the delay involved in the growth of a much larger brain [than that possessed by the great apes]* seems to be responsible for disturbing the order of development of the teeth and jaws." (Page 8.) "No other member of the human family [other than modern man] has a really projecting chin. . . . It seems not improbable that the fundamental factor in the process of chin development is the retardation of the eruption of the teeth in *Homo sapiens* . . . as the result of a lagging in the expansion of the jaws, there is, until the time of adolescence, inadequate space for the second and third molars to erupt . . . In *Homo sapiens* the delay in the eruption of teeth limits the growth of the tooth-bearing part, or alveolus, of the jaw, so that it lags behind the rest of the jaw, the bone of which is subject to the general growth tendencies which affect the body as a whole. Hence the chin can be regarded in a sense as a symbol of man's higher mental development. The growth of a larger brain in man is responsible for restrain-

*The brackets are mine.

ing the growth of the jaws and the eruption of the teeth, and so for allowing the rest of the jaws to expend some of its material and energy in forming the chin."

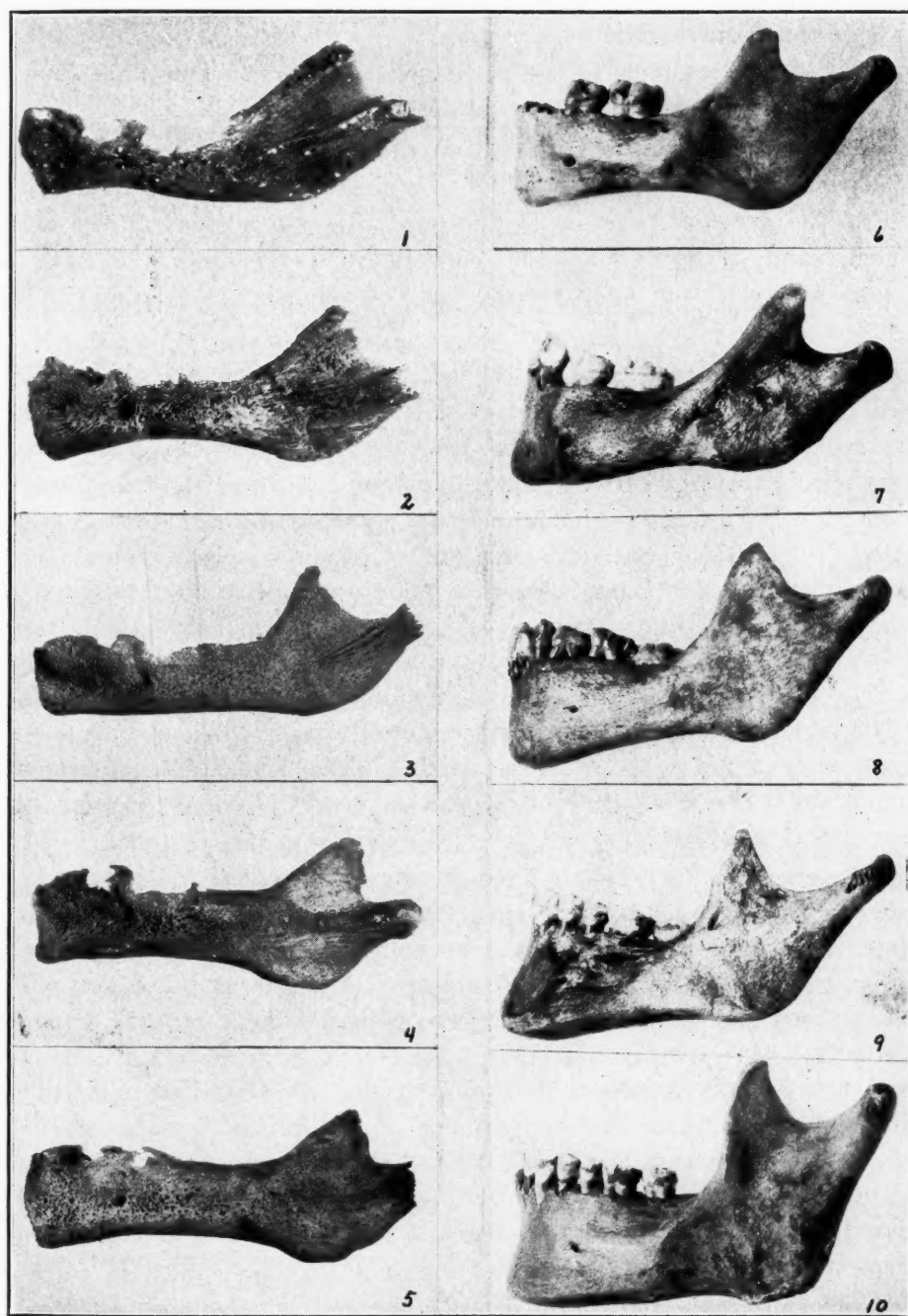


Fig. 1.

Wishing to test the validity of this hypothesis I have assembled through the kindness of Dr. Alexander Wetmore, assistant secretary of the Smithsonian Institution and director of the U. S. National Museum, and Dr. Alš Hdrlička

of the National Museum, a series of human jaws representing all stages of development.

If the hypothesis that has just been outlined were sound, such a series of jaws could reasonably be expected to show that some definite and striking change in the form of the chin region was associated with the period of change from the deciduous to the permanent dentition. The plate shown in Fig. 1 has been prepared to show what actually happens.

In order to concentrate attention on the successive changes in form, all the specimens have been photographed at a uniform length determined by the length of the greatest practicable photographic enlargement of the smaller specimen, namely, the two months' embryo. These photographs have been arranged in a series for comparison. The following is a brief description of each figure in the plate.

The jaws illustrated are the left half of the mandibles looking at them from the buccal side. No. 1 is that of a white human male fetus, a little less than three months old. The extreme length of the jaw is 12.5 mm. No. 2 is a white female fetus of between three and four months old; its jaw length is 21.5 mm. No. 3 is a white female fetus five to six months old, the jaw length is of 3.7 mm. No. 4 is from the fetus of a negro, male, of seven or eight months, with a jaw length of 36.7 mm. No. 5 is a negro female of about eight to nine months old, it is 44.25 mm. long. Nos. 6 to 10 are from Eskimo children collected in different parts of Alaska. No. 6 is about two years old and 81.1 mm. long. No. 7 is about four years old and 84.2 mm. long. No. 8 is six years old and 94.3 mm. long. No. 9 is twelve years old and 114.2 mm. long. No. 10 is about sixteen years old with a length of 129.1 mm. The specimens as arranged show the general trend of development that may be seen in the larger laboratory series.

In the course of this study I have examined about 200 skeletons of human fetuses.*† These ranged in age from about two months to term, as determined from the records of the physicians who collected and preserved them. The skulls and jaws of several hundred children of different races, sex and nationality, both ancient and modern, were used, the ages ranging from term to maturity. Through the courtesy of Dr. Gerrit S. Miller, Jr., the skulls of a great many "Old and New World" primates were studied, including the anthropoid apes. Again many specimens of the human fetus in vitro were studied. This material was available at the Surgeon General's Museum, Washington, D. C. Many of these fetuses were chemically "cleared" so that the jaw bone could readily be seen through the surrounding tissue.‡

The dried fetal mandibles in the National Museum collection were compared with embryonic material of similar age and size, belonging to the Carnegie Institution of Washington. This material had been "cleared," and pre-

*For comparative ages and fetal length, see tables of *Alexandr  Harpin*, Paris Th ses. 1906-1907.

†*Dr. A. H. Schultz* of Johns Hopkins University Medical School, Baltimore, Md., and *Dr. George L. Streeter* of the Department of Embryology of the Carnegie Institution of Washington, at Baltimore, Md., kindly permitted me to study this embryologic material.

‡For technic of clearing embryonic material see, *Charles H. Miller*, Report from *Anatomical Record*, Vol. 20, No. 4, March, 1921.

served in pure glycerin. In these specimens it is possible to see distinctly the bones through the enveloping tissue. A similar comparison was made with "cleared" embryonic material prepared to show the cartilagenous development of the human embryo. This comparison showed that the serial specimens had suffered no distortion.

The study of the several hundred fetal and juvenile jaws here discussed, revealed that there were great individual differences, between jaws of any given age as well as between jaws of different ages, that at an age somewhat less than eight months the human fetus has a distinctly projecting chin, an example of which is shown on No. 4 of Fig. 1. Again there may be essentially as much chin at two years of age as at sixteen years of age as shown in No. 6 and No. 10. In fact, in the juvenile jaws studied many jaws of younger children showed a greater degree of chin development than those of a much later age. While the adult jaw is naturally very different from the fetal jaw, there is no definite period when the chin suddenly springs into being. It was observed that at all ages, after the cartilagenous stage, the chin was more or less well developed.

The idea that the brain takes energy away from the jaw during the earlier stages of alveolar development cannot be maintained in fact. It is well known that in the alveolar processes during the fetal stage and in the early juvenile stages of human growth, this region is an area of intense activity, in building up and tearing down of bony tissue as the two sets of teeth are developing, and while the brain is increasing in size. In addition to this there is a great amount of energy expended in the formation of the roots, pulp, dentin, cementum, enamel, and the investing tissues of the human teeth. This is an unusual condition which occurs in no other bones of the human skeleton than the maxillae and mandibles.

At this date the literature has not revealed to me any experimental evidence which will support the Bolk-Smith hypotheses. On the other hand my own studies seem to show that there is no correlation between human jaw and human brain development.

The following selected references have been found very valuable in making this study:

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FRACTURED AND LOST ANTERIOR TEETH

TREATMENT AND RESTORATION OF FRACTURED AND LOST ANTERIOR TEETH IN CHILDREN

CHILDREN'S DENTISTRY SECTION DETROIT CLINIC CLUB
W. C. McBRIDE, DIRECTOR

INTENT upon the study of the treatment and restoration of fractured and lost anterior teeth in the mouths of child patients—perhaps the most perplexing problem in dentistry—the members of the Children's Dentistry Section of the Detroit Clinic Club evolved the possibility of soliciting the operative procedures, incident thereto, of those men in whose practices these conditions were most frequently encountered.

Accordingly, some one hundred and twenty-five questionnaires were sent to pedodontists, orthodontists, and others interested in the care of children throughout the United States. Sixty-one replies were received, forty-nine of which are shown here; the remainder were courtesy answers from men who at the present time are not actively engaged in operative pursuits.

In brief the questionnaire read as follows: What is your method of treatment and restoration for the following cases?

- (1) Child, 8 years; maxillary central incisor, lateral fracture, with incisal one-half lost, desensitized pulp protruding from tooth.
- (2) Child, 8 years, maxillary central incisor, diagonal fracture, not involving the pulp but close enough so that pulp shows pink through the dentin.
- (3) Child, 8 years; (a) One maxillary central incisor lost.
(b) Two maxillary central incisors lost.

While the age is definitely stated above, the thought in general is concerning children from seven to eleven years—prior to apical formation. For uniformity, it is assumed that conditions in general, i.e., the child's physical condition, parent's financial condition, together with the wishes of both child and parent, would indicate treatment and restoration.

Some of the reports are duplications in part, some only slightly dissimilar; but, as a whole, they present a wealth of material, a portion of which may be useful in every type of practice.

The following men, members of this study group, are gratified to have the privilege of assembling, utilizing, making a few contributions to, and finally disseminating this information: C. W. Wilson, Fred Wertheimer, Paul Ludington, Earle Keim, Floyd Arnold, Mark Gardner, Jr., Frank Koepel, Howard Burkart, Norman Dahn, C. E. Martinek, Cecil Thompson, W. C. McBride.

A summary of the many suggestions made in answer to these questions would present a general picture of the subject and enhance the interest in the individual reports which follow. The suggested procedures for each question are as follows:

I

Treatment.—All suggested or intimated the use of the x-ray examination to determine the apical condition and the possibility of root fracture.

Five reports advised covering of the pulp in an attempt to maintain its vitality.

Five reports suggested immediate extraction.

Twelve reports suggested pulpotomy.

Twenty-two reports suggested devitalization.

Restorations.—Temporary: Caulk's form with sedative treatment.
Caulk's form with kryptex or silicate.
Copper band with cement.
Gold band with cement.
Orthodontic band with kryptex or silicate.
Shallow three-quarter crown onlay with silicate window.
Three-quarter crown or pinledge with porcelain window.
Open face crown with porcelain window.
Post inlay with porcelain window.
Post inlay, all gold.
Swedged platinum or gold cap.
Gold inlay with porcelain window.

Permanent: Cast gold thimble and jacket crown.
Davis crown.
Gold shell crown.
Three-quarter porcelain jacket crown.
Porcelain jacket crown.

II

Treatment.—All suggested or intimated the use of the x-ray examination to show proximity of the horn of the pulp to the line of fracture, the apical development and the possibility of root fracture.

All advised covering the pulpal area with a sedative treatment for a brief time while the tissue swelling and soreness subsided. Then to cover the treatment with cement or silicate held in place by one of the temporary restorations listed below.

Restorations.—Temporary: Caulk's form with medi-cement.
Caulk's form with zinc oxide and eugenol paste.

Caulk's form with pulp capping, covered with kryptex or silicate.
Gold band, incisal edge soldered.
Orthodontic band with incisal edge soldered.
Orthodontic band with gutta percha.
Gold shell crown.
Cap crown.
Three-quarter cast crown, gold or porcelain incisal tip.
Gold inlay.
Gold inlay with porcelain window.
Three-quarter onlay with cervical lip extension.
Three-quarter onlay with buccal lip extension.

Permanent: Gold inlay hollowed for pulp capping.
Veneered gold inlay.
Porcelain inlay.
Porcelain jacket crown.
Gold inlay with porcelain window.
Shell crown.

III

Restorations.—Temporary: Full palate denture.
Partial denture with clasps.
Partial denture without clasps.
Partial denture with Crozat crib clasps.
Horseshoe spring denture.
Gold saddle denture.
Vydon partial denture.
Removable bridge.
Hawley retainer.
Orthodontic bridge (bands on abutment teeth with pontic).
Mesiodistal grip clasps for central with pontic attached.
Lingual arch supporting missing teeth.
Lingual arch space maintainer.
Band and loop space maintainer.
Gold crowns on deciduous canines supporting gold saddle with central incisors.

Permanent: Fixed three-quarter crown bridge.
Removable bridge.

Recommendations for an established procedure, as set up by the members of the Children's Dentistry Section, will be included at the end of the report, which will be continued in the next issue of the Journal.

The individual reports following are not listed in order of importance or preference but in the order in which they were received. The numbers are used only for reference.

(1) *Charles A. Sweet*, Oakland, Calif.

1. Advise removal of pulp under local anesthetic, sealing in a dressing of formocresol. After proper treatment according to the discretion of the operator the root canal is then filled. The tooth may either be restored temporarily or allowed to go as is for a period of one year. Make x-ray examination at the time of the finish of the root canal filling, which should be of some impervious and nonabsorptive material such as gutta percha. X-ray examination again at a lapse of six months and one year. Tooth may be restored permanently at that time if indications are favorable.

2. A well-fitted orthodontic band is made, tacking the incisal edge together, or a well-made gold shell crown. The incisal edge is desensitized with 95 per cent phenol and covered with a thick mix of zinc oxide and eugenol. The band or crown is then cemented to place with crown and bridge cement, and prayers are offered daily. Either the pulp will remain alive, or the apical foramen will be closed so that proper root canal work can be done. Tooth should be tested frequently for vitality, and any evidence of the death of the pulp should immediately indicate root canal work. If the pulp remains vital, at about fourteen years of age a porcelain inlay or onlay (Hogeboom technic) or a porcelain jacket crown may be used to restore the tooth.

3. These cases are worked out with the cooperation of an orthodontist, by either shifting or maintaining space. Permanent restorations with fixed bridgework is not indicated before the fourteenth year, but many times a partial plate can be used to retain the space and supply artificial teeth.

(2) *F. Blaine Rhobotham*, Chicago, Ill.

1. Using infiltration anesthesia I would perform a pulpotomy, filling the upper half of the root canal with a neutral paste. As a restoration, during the time of uncertainty as to whether the apical tissue will remain vital and complete the root, I would make an open face crown for the tooth, filling in the incisal portion with synthetic porcelain.

2. At the first sitting I would seal a damp dressing of cresatin over the fractured dentin using a celluloid form as a means of retention for cementing the treatment. After a week free from pulpitis, I would cover the fracture with cement in which eugenol was incorporated. As a restoration I would use a three-quarter cast crown building in the angle with either gold or porcelain.

3. In both cases (a) and (b) I would use a full maxillary vulcanite palate to which the substituted tooth or teeth had been attached. There is no need for clasps. New impressions and revulcanizing is required as development goes on, but the entire laboratory cost is but about \$2.00 and therefore not prohibitive.

(3) *John Gurley*, San Francisco, Calif.

1. A child eight years old presenting under the conditions described would, of course, be submitted to x-ray examination of the tooth. This is necessary because stages of development will vary between children. Ordinarily the root of a tooth of a child of that age is only about two-thirds to three-fourths developed. Such being the case our treatment will be as follows:

If the pulp is still vital, an effort should be made to maintain that vitality and retain the tooth. This may be accomplished by sterilizing a little piece of tin foil, bending upward so as to protect the pulp, dipping the edge in shellac, placing upon the tooth and flowing cement over—even with a copper or gold band which has been placed around the tooth. This will probably hold for awhile, and may through increased stimulation of the odontoblasts hasten root formation so that later the pulp may be removed and the canal filled. I have had two such cases in my own practice. If, however, pulp disintegration has begun, the tooth should be removed and a space maintainer of some sort be placed until the youngster is old enough to have a bridge made.

2. I have had a great many diagonal fractures, the great majority of which did not show pink. In most of these I simply smoothed the sharp edges with a sandpaper disk and let them alone. Sometimes I paint over the surface with zinc chloride solution, sometimes I may flow a little thin cement thereon. A little later if there is sufficient dentin formed within the pulp chamber to provide a better protection, then I may drop in a little at strategical points and flow cement over the surface, sometimes with a band round the root and sometimes not. I have not found the bands very successful. My experience leads me to believe that the less we tamper with them the better off we are.

If the exposed tooth surface shows pink, then according to the degree of intensity would treatment be indicated. It may be well to place a pulp capping of the formula tri-calcium phosphate 30 parts, thymol six parts, as a powder, with a liquid composed of menthol 2.6, thymol 5.2, phenol 24, then flow cement over this. The idea should be to care for this tooth rather than to take care of it.

3. Ordinarily I would say that space maintenance of some type should be placed until the youngster is old enough to have something placed in the nature of either a bridge or a partial denture. Here I think is an instance in which Dr. Willett's work would fit in admirably. In some cases it might be well to maintain only the space of the central incisor, bringing the canines forward in the position of the lateral incisors.

(4) *R. C. Willett*, Peoria, Ill.

1. When a child is presented with a fractured central or lateral incisor involving pulp exposure, I immediately isolate the tooth with a rubber dam and sterilize it with hexylresorcinol. When the hemorrhage is stopped, I cover the pulpal exposure with a mixture of oxide of zinc and eugenol or oil of cloves. I believe that oil of cloves is to be preferred. The tooth is fitted with a gold and platinum band and cemented to place with a nonirritating cement, avoiding any pressure upon the exposed pulp of course. If the tooth retains its vitality, all well and good.

It seems to me that results have been better where the fracture has been so serious as to involve the pulp than in many of those cases where the tooth has merely sustained a sharp blow. In the cases where there has been no serious fracture of tooth structure, there seems to be no escape for a clot that may have occurred, and for that reason the pulp more frequently becomes devitalized.

2. No reply.

3. I have in such cases supplied the lost tooth by means of a partial plate. I do this in preference to any attachment to deciduous or permanent teeth. It is frequently necessary to remake such partial plates. I never found it necessary to use clasps or stabilizers. The plate is merely held in place through tissue support. Most of the children I have had experience with readily adapt themselves to the use of such partial dentures. Only in the event of a child wholly irresponsible have I resorted to a fixed retention, and in doing so have avoided bridging the median line. I do not feel that permanent bridgework should be considered until such a time as the permanent canines

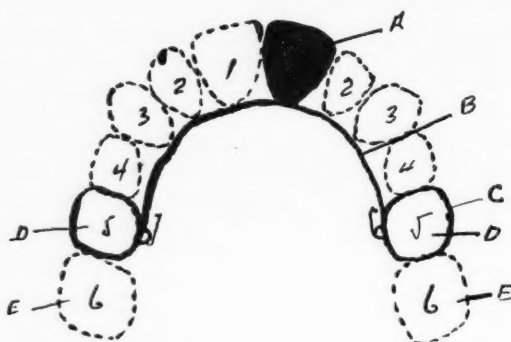


Fig. 1.—A, Steele's facing; B, 18-19 gauge wire; C, 32 gauge band material; D, deciduous fives, or second deciduous molars; E, first permanent molars.

have fully erupted. Under no circumstances would I consider lateral incisors suitable anchorage for a fixed bridge.

(5) *Claude W. Bierman*, Minneapolis, Minn.

1. My diagnosis is based on the following facts. Age, health, future health with reference to a healthy oral cavity and also an infected oral cavity due to devitalized teeth, the root development at eight years of age, the possibility of successfully filling the canal with a large jagged foramen present, what finished result could be attained in rebuilding the case, the child's present and future comfort.

I believe from the above that I would be justified in removing the tooth and placing a temporary facing. Later, as the permanent lateral incisor erupts, a bridge may be constructed which will be of service until the child is old enough to have a permanent bridge.

In placing this first temporary facing, I would make orthodontic bands for the maxillary deciduous fives (deciduous second molars) make a lingual appliance, using either 18 or 19 gauge arch wire, select proper shade of Steele's facing and solder the backing to the lingual arch, adjust the facing,

cement it and place the lingual appliance in the mouth. I have used a great many of these, and have had very little trouble with them. (Fig. 1.)

Later as the lateral incisor erupts, the bridge may be made more permanent by taking impressions of the central and lateral incisors on either side of the space. It might be necessary to cut through the distal contact on both teeth, and if so, use a disk for this purpose. Pack these impressions, and then on the metal dies wax a three-quarter overlay using a 37 gauge plate wax for this purpose. The wax should be carried over the mesial distal and incisal on to the labial surface just far enough so the overlay cannot be dislodged lingually. These wax overlays should be finished to a featheredge at the gingival margin. Invest and cast with a hard gold of light color. Finish the bridge in the usual manner and cement to place.

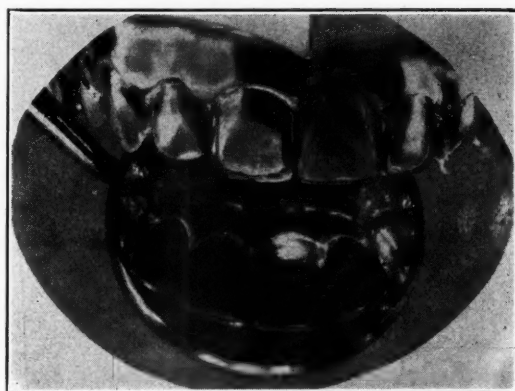


Fig. 2.

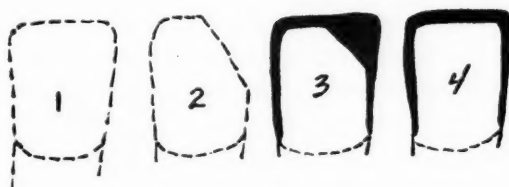


Fig. 3.—(1) Normal tooth; (2) fracture; (3) wax overlay on tooth; (4) overlay cemented with anterior enamodent.

2. These cases, which are quite common, I always examine with x-ray pictures first; and if the picture is normal, then I give my attention to the rebuilding of the tooth. I cut a piece of gold platinum banding material, 36 or 37 gauge, and fit it over the dentin where the pink pulp tissue shows. I then mix some sterident powder No. 2 with pimento eugenol (the sterident liquid), and have this mixture as thick as can be handled. Place a small amount of this sterident over the broken dentin and then gently shimmy the gold piece to place. Allow to harden thoroughly and then take the impression for the three-quarter overlay the same as was done under question 1. In waxing the die, carry the wax to the desired incisal length and width. Also extend the wax on the labial surface to prevent lingual dislodging. Cut away any wax that might be over the broken tooth, cast with hard light color gold.

In cementing this to place, I use the anterior enamodent in the proper shade. Before dismissing the patient, after the impression has been taken, be sure to cover the tooth. For this purpose I generally use a copper band and temporary stopping, as it is for a period of less than twenty-four hours.

3. (a) This has been explained in the answer to question 1, although in either case, the deciduous five or permanent six [deciduous second molar and first permanent molar] may be banded. Sometimes a partial cast occlusal is soldered to the orthodontic bands for more strength and cementing surface.

(b) Probably here a partial plate would be indicated or a horseshoe plate with two central incisors attached. Use this until the child has developed enough to place a bridge similar to the one shown in Fig. 2.

(6) *Joseph T. Cohen*, Minneapolis, Minn.

1. In answer to the first question, I would either extract the tooth or devitalize, most likely the latter. I would then prepare for and rebuild the tooth with a Davis crown. The patient, however, would be informed of the dangers, and would be warned that the replacement was but temporary and should be carefully and frequently rechecked by a dentist.

2. In answer to the second question, I would cap the pulp and construct a modified three-quarter crown replacing the fractured portion of the tooth with a silicate cement. By modified three-quarter crown, I mean paralleling the approximal walls of the tooth in question, and then constructing the restoration, eliminating the grooves but getting the retention by slightly overlapping the labial of the tooth on the mesial and distal. The casting should be made of a hard gold.

3. Accidental loss of either one or two maxillary permanent central incisors could be replaced by either a partial denture, or a regular anterior stationary bridge. A removable bridge should be used until the lateral incisors are properly erupted, at which time a fixed bridge could be constructed with either modified three-quarter attachments on the laterals or orthodontia bands used for retention on the abutments. I prefer modified three-quarter crowns, whenever possible, because of the esthetic appearance.

(7) *H. S. Dwyer*, New York City. In all cases I shall attempt to give, first, the procedure which would be indicated in clinic procedure, and second, the method employed in private office procedure.

1. (a) Extraction would be clinic routine.

(b) Although I am not a believer in root canal therapy, especially in cases where the apex is not fully calcified, if the case was one in which physical condition of the patient could stand a pulpless tooth, and the treatment was done immediately after the accident, I would remove the pulp under a local anesthetic. Under as nearly aseptic conditions as possible the root would be filled using a paste formed from paraffin, potassium iodide, and chloroform. It has been my experience that this paste is nonirritating and if a little bismuth is added shows up nicely in the x-ray picture. This particular paste is especially useful if it is necessary to fill deciduous roots. The tooth would then be prepared for a cast gold thimble and over that a porcelain jacket.

2. (a) Silver nitrate precipitated "up-side-down" by eugenol and after a period of observation an attempt at filling with whatever anterior filling cement was used in the clinic.

(b) Every effort would be made to save the pulp, and the tooth carried along for a period of observation, with a celluloid form and gutta percha over a period of a month to six weeks with repeated x-ray pictures. Then a form of lingual onlay supporting an inlay would be used for restoration. The inlay part to be hollowed out next to pulpal portion to permit an extra layer of protecting cement. (I have two such cases on the same child at this writing—youngster is nine years old. Gosh darn these drinking fountains anyway!)

3. (a) In the average clinic this is "just too bad," although some of them here do put in a small rubber horseshoe plate.

(b) Until the child has reached an age where the roots of the remaining teeth will stand the stress of regular adult bridgework—either fixed or removable—both of the cases in Question 3 would be taken care of by means of a light, small rubber plate of the spring horseshoe type. This should be placed as soon as possible to avoid developing incorrect habits of speech. I do *not* believe in the use of shell crowns—white, gold, or green—on any tooth and certainly not on the teeth of growing children where the usual resulting food impactions cause not only gingival injuries, but a wedging of the teeth with a resultant malocclusion.

(8) *H. J. Burkhart*, Rochester Dental Dispensary, New York.

1. Remove pulp either by pressure or infiltration anesthesia. Fill canal and seal with cement, and allow tooth to remain in this condition until the child reaches the age of eleven or twelve years. Then restore with detachable jacket crown. However, if there is an early crowding of anterior teeth, restoration will be indicated earlier.

2. Sterilize surface of fracture with phenol. Make up a band of 32 gauge pure gold and adapt to crown and fill incisal portion with 20k gold solder, thereby forming a gold cap. Place thymold over pulp and then cement cap in place, allowing it to remain on tooth until child reaches the age of fourteen or sixteen years. Then replace with veneered gold inlay or porcelain inlay.

3. Place space retainers on both cases. When the child is fourteen or fifteen years old, replace with partial plate. Then replace this with bridge in several years.

(9) *Percy R. Howe*, Forsyth Dental Infirmary, Boston, Mass.

1. Partial pulp removal—unless putrescent. Fill root with C. P. zinc oxide and eugenol paste—no pressure. Previous to filling canal, wash pulp canal with physiologic saline or Dakin's solution. Keep away from apical region with instruments. Even if pulp were entirely removed, bone would fill in in apical region. Repair fracture in any way you like, but it is better to wait until later—when child is thirteen or fourteen years old—before more permanent root or restorative work is undertaken.

2. Cap pulp with C. P. zinc oxide and eugenol. Restore form as above.
3. Space retainer—removable preferable—as temporary measure.

(10) *Kenneth Easlick*, University of Michigan, Ann Arbor, Mich.

1. a. Anesthetize.
 - b. Amputate pulp, cutting it off one-third of distance up root canal.
 - c. Clean out hemorrhage and stop bleeding with hydrogen peroxide and physiologic salt solution.
 - d. Cover amputated stump with creamy mix of Kerr sealer powder plus glyceride of iodine.
 - e. Follow with regular mix of Kerr sealer.
 - f. Permanent cement.
- g. Restoration. Shallow three-quarter crown onlay, cast with hard gold, and with silicate cement window.
- h. Periodic radiographic examination.



Fig. 4.

2. a. Carry two or three weeks with medi-cement and celluloid crown.
 - b. Restoration.
 - (1) Three-quarter crown onlay above or
 - (2) Three-quarter crown clasp.
 - (1) Disk proximals slightly.
 - (2) Stone lingual enough to relieve occlusion if necessary.
 - (3) Compound impression and wax bite.
 - (4) Die and model.
 - (5) Wax up as for three-quarter crown plus 2 crescent shaped lips.
 - (6) Cast out of regular hard gold clasp metal, e.g., Chicago 4.
 - c. Treatment before setting.
 - (a) Phenol plus slight alcohol plus dry.
 - (b) Paint with "white" silver nitrate.
 - (c) Thick mix of Kerr sealer over pink spot.
 - (d) Permanent cement.
 - d. Silicate window later.
3. We have been resorting to banding the first permanent molars, lingual wire, and Steele's facings. This procedure is rather unsatisfactory since it makes a long span with too much play and is easily loosened.
- In the unusual case we might resort to banding the adjacent teeth in early calcification, and we are always glad to step forward to the premolars for retention as soon as they erupt into occlusion.

(11) *William Dwight Tracy*, New York City.

1. Extirpation of pulp, routine root therapy and canal filling where any prospect of successful result seems possible.

2. Isolate the tooth, bathe with Morson's English Beechwood Creosote, mop off with chloroform, create slight retention grooves with No. 0 bur, touch the pink area with varnish, place covering with oxyphosphate of zinc cement, making no effort to restore contour, and watch events. Test for vitality a month later and at subsequent periods. Restoration of the tooth is another consideration after the tooth has demonstrated its capacity to maintain vitality—in case the pulp becomes nonvital follow with routine procedure.

3. (a) I would suggest a tiny vulcanite saddle with two wire clasps and lug rests engaging palatal surfaces to support the missing member and also to serve as a space retainer until the patient is old enough for more radical restoration.

(b) Saddle of similar type carrying two teeth may be used, although in private practice we have made a light skeleton frame on which the two teeth are mounted and which is retained in place with crib clasps with round wire having T bars which engage the buccal surfaces of any teeth posterior to the canines available for this purpose. A device of this type with occasional changes may continue useful for several seasons.

(12) *Paul Barker*, Denver, Colo.

1. In such cases the pulp can seldom be saved, for if the blow has been sufficient to desensitize the pulp, the pulp will usually die within a short time, and it is preferable in most cases to resort to a pulp amputation or a complete extirpation before proceeding with a restoration.

There are, however, exceptions to this where the pulp is only slightly protruding or is simply exposed, when excellent results may be obtained by covering the exposure with a zinc oxide and eugenol paste and cement for several days, and then if pulp remains quiet building the restoration to protect the exposure permanently.

I have tried different methods of restoring these fractured teeth, such as gold crowns, orthodontic bands, etc., but in all cases where there is enough tooth structure left protruding from the gums to obtain a good impression I prefer the following method, especially in a case where the child is a girl.

After the pulp is satisfactorily cared for in one of the above mentioned methods, the tooth stump is built up with cement, preferably Kryptex, to approximately the shape it had before the break. Cement is allowed to set hard. Then with sandpaper disks and fine stones trim and polish to shape desired for completed tooth. Proximal surfaces of tooth stump and cement are now flattened and paralleled, and a thin bevel is extended over the labial angle and a bevel placed on the incisal edge.

If enough tooth structure remains, a groove may be sunk in each proximal surface with a No. 700 fissure burr parallel with long axis of tooth, for additional anchorage. A copper band is now fitted and modeling compound impression taken of the whole tooth. The cement restoration will occasionally come away with the impression and must be carefully removed with a burr,

being careful not to injure the impression, but this can usually be prevented by lightly lubricating the tooth with oil or vaseline before the impression is taken. An amalgam die is now made from the impression, and you have a model of the tooth as you wish it to look after the restoration is placed. A three-quarter veneer crown is now waxed up on the model and cast in hard gold, being sure to carry the proximal margins well over the labial angle for retention. Casting is now swaged to model and polished, removed, and a small window cut in the lingual surface just below the broken edge of the tooth.

The veneer crown is cemented to place on the stump after all cement except that covering the zinc oxide pulp capping is removed, and after this cement has thoroughly set proceed with final step. You now have a frame of hard gold around the mesial, incisal and distal surfaces of the tooth which is perfectly shaped, to match the remaining uninjured central incisor, and into this frame you build a restoration of translucent enamel, being careful to obtain the correct labial curvature or convexity to correspond with the other central, and being sure to place a celluloid strip on the lingual surface so that a smooth finish may result on the enamel which is forced through the little lingual window.

After the enamel sets, it is polished and finished, and you have a very satisfactory restoration, providing protection for an exposed pulp, a minimum of gold showing and translucency of the enamel restored.

This restoration will not, of course, stand much of a blow labially, nor will it stand a lot of taffy or caramel candy, for one can generally obtain only a minimum of proximal retention, but these drawbacks are always explained to the parents, and in spite of them they generally prefer it to a full gold cap or band.

2. Would proceed as above, only I would never remove pulp except as last resort.

3. (a) Restore central incision with dummy swung between bands (either cast or adapted) on remaining central and lateral incisors, this to remain until patient is fourteen or fifteen years old, when permanent restoration is placed.

(b) Either follow same procedure as in (a), placing abutments on lateral incisors if apical formation is sufficient or central incisors may be placed on a partial denture. With the young child the fixed restoration is preferable.

(13) *F. A. Delabarre*, Boston, Mass.

1. (a) X-ray examination to determine the full extent of injury. Aseptic extirpation of the pulp followed by immediate root filling under x-ray check-up.

(b) Cementation of an orthodontic band to maintain space until the traumatic reaction and the root filling have been time tested for subsidence of symptoms or occurrence of infection.

(c) Restoration of tooth form by one of the many possible procedures with the first choice, perhaps, of a porcelain jacket crown.

(d) Extraction in such cases should be considered as a last resort.

2. (a) X-ray examination to determine the full extent of the injury.

(b) Exhibition of sedatives to relieve congestion of the local area; placing of an orthodontic band with temporary gutta percha. Watch the case closely for symptoms of pulp involvement; every day gained without any involvement increases the possibility of conserving the pulp. The chances are largely against such an outcome, but every chance should be taken because in early childhood the physical rebound, following injury, is surprisingly strong.

(c) A time test of one month would justify removal of the band and immediately resetting with cement, with a layer of temporary gutta percha over the fractured area.

(d) Repeated temporizing with a continuance of this treatment to give time for deposition of dentin until x-ray pictures show sufficient protection to allow restoration of the corner with a porcelain tip, which would probably be not earlier than the fourteenth year.

(e) If the pulp becomes involved, proceed as in No. 1, but postpone the restoration until the danger of subsequent infection has passed.

3. A real tragedy!

Some immediate restoration is advisable to prevent loss of space by migration of the lateral incisors and the canines, and for other obvious reasons. No restoration at this age can be permanent. Bridgework of any sort is contraindicated because of the immaturity of the roots of the neighboring teeth.

There are but two resources: a partial plate, which will require frequent remaking to conform to the natural growth changes due to take place in the subsequent years up to full adolescence, changes in width, height and in the anteroposterior direction. The second is an orthodontic appliance consisting of bands on the first permanent molars with vertical palatal tubes to receive a 19 gauge palatal wire touching each tooth at the gum line, to which are soldered the backings of porcelain central facings.

The latter has the advantages of adjustment to the growth changes as age progresses, particularly to the natural forward drift of the molars as the deciduous molars are lost in succession. The disadvantages are the technical skill required for making and adjusting and also the necessity of wearing and recementing the molar bands from time to time over a period of four or five years for hygienic reasons. For the permanent restoration, after maturity, the best is a small "butterfly" or skeleton gold plate carrying the missing teeth with clasps to prevent displacement. There will be far less danger of damage to the remaining teeth than with any form of bridgework, and consequently there will be better mouth health and function in later life.

(14) C. V. Shaw, Colorado Springs, Colo.

1. The pulp treated by McCollum's amputation method as described by Jordan in her *Operative Dentistry for Children*. When pulp reacts normally (two to three weeks) a gold casting (three-quarter crown or pinledge) is made

to fit the stump, with the missing crown portion filled with porcelain. A porcelain jacket is constructed later when patient is sixteen to nineteen years old.

2. Same as No. 1. I am eager to improve, but I have had so many pulps die under capping that I feel that it is a failure in my hands. If the break is not too deep, I have success with silver nitrate and oil of cloves.

3. (a) A mesiodistal grip cast clasp is made for the remaining central incisor, a pontic soldered to this and the clasp cemented to the tooth. This must be watched frequently, as it must be recemented at once if the cement is washed from the margins. A permanent fixed bridge is constructed when gum line is stationary.

(b) Both central incisors restored by horseshoe type maxillary partial denture, (a) may be restored in the same manner.

A simple space maintainer may be constructed, but the teeth should be restored by pontics if at all possible. One of the best methods to treat these cases cannot be illustrated, but it is this—*remove all of the old style drinking fountains at the schools, and install side-spray types.*

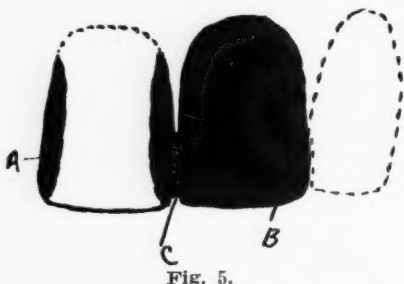


Fig. 5.

Fig. 5.—A, Central attachment; B, pontic; C, soldering at incisal edge.

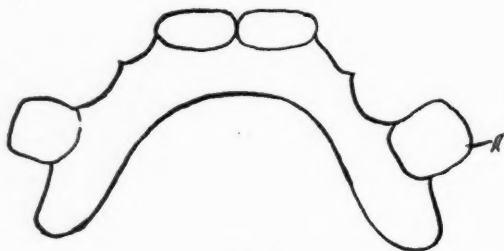


Fig. 6.

Fig. 6.—A, Some form of crib clasp.

(15) *Walter T. McFall*, Macon, Georgia.

1. When these cases come in, I try to do as little as possible at first or second sittings. I attempt to relieve pain by use of oil of cloves or creosote applied to exposed surfaces and covered over with the base I always use in place of cement. Then I cover the whole tooth with dry foil to protect it from exposure and thermal change until acute symptoms subside. I use poloris poultices in all such cases and always prescribe a light saline laxative. I insist upon finger massage to keep up stimulation to the parts, and urge toothbrushing to other parts of the mouth except where there is local irritation. When the child is feeling better and the pain has subsided somewhat, I use either mucoperiosteal injection of procain or pressure anesthesia with wafer pellet to complete devitalization of nerve.

Bearing in mind that the apical end of tooth has not closed, I attempt to ream out not more than the upper two-thirds of the root, of course x-ray pictures have helped me determine this matter. Then I place dressing of creosote for one or two treatments, provided there was swelling or putrescence; and when tooth is tightened and easy, I complete the root canal filling, using the same base I make together with a foreshortened gutta percha point.

I then observe it for six weeks to two months to be reasonably sure the tooth will remain comfortable, and the restoration then is to be a porcelain jacket crown if the tooth is ready to receive this permanent restoration. Or, using a Caulk's crown form, I place a platinum pin in the pulp canal to aid in retention, then reproduce with Caulk's Detrey's Synthetic, or use an open face, well-fitting, shell crown and face in with synthetic porcelain.

2. I do not usually believe in so-called capping of pulps, but in these instances I do, and I attempt it by telling the patient and promising nothing. I use Caulk's phenol to assure sterilization, then place a crown form on base, and oil of cloves on the exposed incisor stump. I observe this tooth for at least two or three months. The tooth is protected, free from thermal change; the esthetics are not entirely objectionable and when the tooth and patient show we can proceed to repair, I use all three restorations suggested in No. 1, plus a type of hood inlay faced with synthetic. If the tooth does not respond to treatment, I immediately proceed to devitalize it and treat it as a fresh clean exposure, using any of the restorations mentioned.

3. (a) Of course this depends upon whether or not the maxillary permanent lateral incisors and mandibular permanent lateral and central incisors have erupted and sometimes even at eight years the central incisors are just coming in. If the central incisor is well through, I have used spider plate with one tooth, or have banded the adjoining central incisor and run a bar to the lateral incisor to hold the space, or if the other central incisor is far enough through, I make an open face shell crown for the remaining central incisor, solder dummy tooth on and place lug on adjoining lateral, this for esthetics and not service. I always prefer to withhold permanent restoration until the lateral incisors and preferably permanent canines are in place.

3. (b) Where two central incisors are lost, I prefer to use a spider plate, using clasps if possible on any anterior teeth I can, but depending upon molars for retention or support. My experience with removable work in these instances has been that they are grief provoking and unstable and unsatisfactory. I cannot promise a permanent restoration until the front of the mouth fills out, that is until the child is thirteen or fourteen years old.

I always have an x-ray examination made of each of these conditions you have suggested. I rather believe in the pulpotomy or pulpectomy instead of trying to fill these teeth, as we do teeth for adults where the apical ends have closed and root formation is completed. I take considerable time to explain all possibilities to parents and make them understand it is their responsibility and not mine, that I will do the work to the best of my ability, but if they wish guarantees or sure-fire work to try elsewhere or allow me to extract the offending member, then depend upon the orthodontist to retain the space until the other permanent teeth erupt or the child can have a permanent restoration placed which will assure service, esthetics and satisfaction.

The base to which I refer repeatedly is:

Zinc oxide (C.P.)		drachms 3
Thymol iodide		grains 20
Creosote and lysol	aa	drops 12

Heavy white vaseline qs to stiff, heavy, base, not a salve or paste, to be worked to consistency of test mixture of Detrey's synthetic porcelain.

Sig.: Use as base in place of cement, pat to place with cotton pellet, use as root canal filling, use to stop toothache, to be used as temporary treatment, to be used to cap pulps, to line the pulpal wall of any tooth, as a nonconductor, sterilizing and anodyne base.

(16) *J. C. Brauer*, Lincoln, Nebraska.

1. I assume this is a natural desensitized pulp, *vital*, protruding. I would prepare orthodontic matrix, mix some zinc oxide with eugenol, place over exposed area, then fill remainder of band with cement (copper or white). See patient monthly, for a few months to see whether tooth is vital and comfortable, then lengthen time between appointments. But if exposure is too great, a pulp treatment is advisable.

2. Usually treatment is same as 1, or, place shell crown in infraocclusion; but this is not as preferable. The case should be watched, noting vitality, stability, etc. Secondary dentin should form, thus in few years allowing for a permanent restoration. A very thin three-quarter crown showing very little gold (hard gold) can be cast, porcelain placed where tooth was fractured, the operator being cautious of acid in porcelain by proper protection.

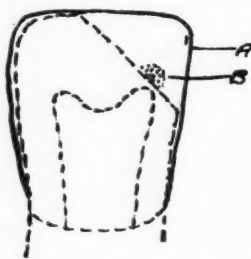


Fig. 7.—A, Crown or matrix; B, pulp capping.

3. (a) If central incisor is lost, band second deciduous molars, using fixed arch with finger extensions to retain space.

(b) Same if two central incisors are lost or may band centrals. If one lost, band lateral incisor and place a porcelain facing with backing soldered to bands; then when teeth are fully erupted, may put in partial plate. These partial plates have been very satisfactory.

(17) *Herbert R. Foster*, Oakland, Calif.

1. (a) Remove pulp from incisal two-thirds of canal.

(b) Seal in cotton pellet saturated with oil of cloves and leave in for one week.

(c) Repeat above.

(d) Fill root canal with thick creamy mix of zinc oxide and eugenol in hopes of root end continuing to form.

2. (a) Form and cement orthodontic band.

(b) Pulp capping material over dentin.

(c) Fill with cement until pulp recedes.

3. Replace tooth or teeth with Steele's removable facing cemented to backing with heavy metal lug soldered to backing and imbedded in vulcanite palatal plate. Round wire 0.036 in., clasps over mesial contact points of first

permanent molars and in retention at first but are not necessary later as child accustoms himself to keeping the plate up without clasps. (Fig. 8.)

(18) *Ralph Wagner, New York City.*

1. Remove exposed pulp and seal in a dressing of eugenol for a few days. Remove and seal a dressing of formocresol for a week. Repeat formocresol dressings three times and fill the root. I use a paste of dentinoid and alcohol which is pumped into the canal. If necessary a gutta percha point is placed to carry the paste to the apex. This is considered a temporary root filling, and the parents are informed that after a few years it must be removed and gutta percha placed.

2. The tooth is dried and hot phenol is applied to the approach to the pulp. A little zinc oxide and eugenol placed over the pink area and an orthodontic band is placed around the tooth filled with cement. If no further trouble arises, the tooth is kept covered until such time as a permanent restoration can be placed without endangering the pulp. If the case gives any reaction indicating death of pulp, it is handled as in answer to Question 1.

3. A partial plate is made to restore the missing teeth until such time as the placing of a bridge can be done without endangering the pulps of teeth

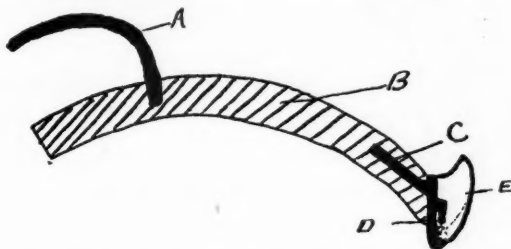


Fig. 8.—A, 0.036 round wire clasp; B, vulcanite palatal plate; C, heavy metal lug; D, metal backing; E, Steele's removable facing.

to be crowned. A small vulcanite palate extending to the first or second molar is used and replaced when necessary after eruption of the bicuspids.

(19) *J. N. Wisan, Elizabeth, N. J.*

1. (a) Celluloid crown form filled with zinc oxide and eugenol is placed over tooth and radiographed. If no pain results this is permitted to stay. After two weeks the form is removed, soft paste of zinc oxide and eugenol is gently placed over pulp, varnished, and form is placed over tooth with cement (pro tem)—requires frequent replacement.

This has been done in five cases—three did not require later pulp treatment.

(b) If child complains of pain, the pulp is removed either under nitrous oxide oxygen or novocain anesthesia and the canal filled with zinc oxide and eugenol. The restoration of the tooth contour is postponed, the development (or nondevelopment) of the root is observed by roentgenograms, and if comparatively normal a porcelain jacket crown is used.

Two cases have been treated, with no clinical reaction.

2. Same as 1 (a). About twenty cases, all successful.

3. Vulcanite or gold saddle denture *without* clasps. (Fig. 9.)

(20) *E. L. Pettibone*, Cleveland, Ohio.

1. Remove pulp, treat root canal and thoroughly fill root. This is to be done most thoroughly and checked with x-ray pictures. Recheck with x-ray pictures four, eight, and twelve months later. Restore incisal half of the tooth using Caulk crown forms and synthetic porcelain. If after one year the development of the root end seems to be normal and no other trouble has developed, make a porcelain jacket crown, provided parents will consent to rigid semi-annual x-ray check-up.

2. Sterilize tooth carefully, dry, and cover portion of tooth where fractured with nonirritating cavity varnish. Select suitable Caulk crown form,

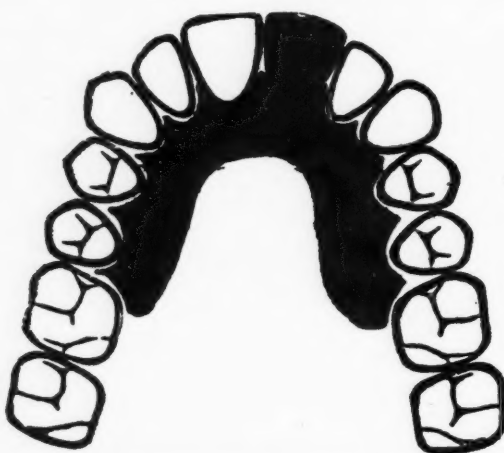


Fig. 9.—Denture without clasps.

fill with carbo-eugenol and have the child report each day in order to learn whether the pulp remains vital or not. If not vital, treat as in No. 1. If it remains vital, use tooth forms to restore lost part of crown, leaving celluloid form on. Insist upon frequent return of patient for observation. When it becomes discolored renew the porcelain. Check with x-ray pictures frequently. Eventually place a porcelain jacket crown.

3. (a) Make orthodontia bands for adjacent teeth, solder them together with wire which can be expanded. Attach facing to wire for appearance. Expand wire to maintain correct arch expansion.

(b) Same procedure as in (a).

(To be continued)

METHOD OF ROOT CANAL TREATMENT*

R. H. SELLWOOD, D.D.S., LOS ANGELES, CALIF.

THERE is a decided difference of opinion as to the treating and filling of root canals because of the variety of influences that have their effect upon the health of the patient.

There has been very little study made of the histology of the deciduous pulp, and often we hardly know just what to do about it, especially some of the cases we get at the clinics, such as hypertrophied pulps and gum tissues, and pathologic pulp tissues. Of course, the easiest way out is the removal of the tooth, but we do not wish to extract these teeth several years before the roots have been normally absorbed.

Scientifically, I believe that the operator should decide the question as to whether or not he should attempt to treat and fill an infected tooth. I feel that I have a certain responsibility to my young patient who has placed himself under my care, trusting me to do the proper thing. When I think of what the premature loss of either the deciduous or the permanent tooth would mean to that child, I just cannot decide to extract without first doing all in my power to save a given tooth. Therefore, first I explain to my patient my reasons for undertaking the treatment of his tooth, knowing that many teeth respond satisfactorily to treatment and give many years of service to the patient. It is understood that I am treating teeth for patients who are on this side of the hill physically, and *not* for adults over forty years of age whose health would not permit retention of devitalized teeth. I am not unmindful of the fact that even when certain teeth appear favorable for treatment, after every effort has been made to restore them to health, they have finally had to be extracted. But no dentist can foresee the outcome of his efforts, nor can he be positive that any one of the many accepted methods of treatment will prove efficacious in every case.

I shall attempt to outline the method of treating these teeth:

ROOT CANAL TREATMENT AND FILLING FOR DECIDUOUS TEETH

The treatment for the deciduous teeth is as follows—usually five treatments will clear up the condition:

First Sitting

Step 1. Complete excavation of the pulp cavity itself. Wash the cavity with warm water in syringe. We do not wish to cause any more irritation than necessary.

*Read before the Southern California Branch of the American Society for Promotion of Dentistry for Children, May 5, 1932.

Step 2. Isolate and dry the cavity.

Step 3. Apply a little peroxide or Dakin's solution, taking care not to force it out into the tissue.

Step 4. Dry the cavity—apply a drop of iodine.

Step 5. Dry the cavity—formocresol on a pledget of cotton almost dry.

Step 6. Seal in with cement, and before the cement dries puncture through with a sharp instrument to allow gases, if any, to escape.

Second Sitting

Open into the pulp cavity.

Repeat the formocresol treatment and seal tight if the tooth is comfortable.

Third Sitting

Same as Step 2, and repeat on each succeeding appointment, until the pulp canal is free from all odor. Then the canal may be filled with any of the accepted root canal filling materials such as Oxpara, Buckleys, etc. Cover the root filling with cement, then insert a copper amalgam or silver filling.

ROOT CANAL TREATMENT AND FILLING FOR PERMANENT TEETH

First Sitting

Open into the pulp cavity and make an outline of the tooth cavity preparation if the tooth is not too sensitive to work on. Clean out with spoon excavators and wash with warm water. Broach out about two-thirds of the canal tissue. All we wish to do is really to vent the apex. If the tooth is badly broken down due to extensive decay, build up the tooth cavity with cement so that you can seal in the dressing properly. This also prevents leakage of medicines upon the tissue. Seal in formocresol, dry.

Second Sitting

Remove remaining portion of the pulp tissue from apex roots, wash the cavity, dry, seal in formocresol.

Third Sitting

Reopen into the cavity, remove the dressing. I would now seal in a dressing (of Black's 1-2-3) to disinfect the dentinal tubuli.

Fourth Sitting

Two treatments of a penetrating essential oil, Eucalyptus.

Fifth Sitting

This is a repetition of the fourth sitting.

Sixth Sitting

If no odor emanates from the tooth and it is comfortable, the end of the canal may be filled with a chloroperecha dressing and point; in other words, cork up the ends of the canals.

Seventh Sitting

You can now open and force an essential oil into the tubuli without irritating the ends of the roots. Oil of Cassia or Eucalyptus is indicated. Dry the cavity, fill canals with any material best suited to the operator.

I suggest covering the pulp chamber with permanent cement and restoring the tooth to its anatomic form with whatever filling you think best to use.

Much of whatever success I have had in treating teeth for children has been due in part to their quick response to treatment, their youth and their cooperation. They seem to throw off any infection very easily. I have checked up on some of the root canal work done at the clinic, and in many instances I have found the former abscessed area filled in with new bone, with no sign of infection and the tooth very comfortable.

I would make a definite appeal to the members of the profession that they give more time to this most important matter of conservation of devitalized teeth, remembering all the time that they are not *dead* teeth simply because of pulp devitalization. The peridental membrane remains alive, and the function of sustenance of root tissue is kept through this means.

HOME PRACTICE OF HEALTH HABITS*

Name _____ Teacher _____

Address _____ School _____

The purpose of this chart (with the suggested diet) is to teach your child wholesome daily habits of caring for his health. Observation has proved that the development of these habits will greatly help him in his school work and prepare him for the problems of adult life. Eat regularly, eat slowly, chew well. Check every night. Check when you do the right thing; otherwise leave vacant.

Date vaccinated _____

Date toxoid completed _____

	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	TOTAL
Eat three meals a day																						
2 to 3 glasses of milk																						
2 leafy vegetables, 1 more																						
Fruit, twice daily																						
Warm cereal with milk twice a week																						
No sweets between meals																						
Cod liver oil																						
Wash teeth twice daily																						
Wash hands before meals																						
Two baths each week																						
Outside exercise 1 hour																						
10 hours' sleep with windows open																						
Bowel movement																						
Breathe through nose, lips closed																						
Stand, walk, sit erect																						
Cavities filled																						
Clean handkerchief																						
Hands away from mouth																						
Cheerful																						
Do parents read health chart?																						

NOTES TO PARENTS

The teacher is eager in helping children form sound health habits to co-operate with you and will appreciate your assistance in encouraging the child to keep this record checked up to date. It should be returned on _____ when it will be transferred to the class chart by the Health Guard. The teacher will use this to help determine the grades your child receives in hygiene, citizenship, and physical education. I have checked this chart honestly and when I have forgotten to check it on the correct day, I have left the spaces for that day vacant instead of filling them in later.

*Marion County Department of Health, Salem, Oregon.

Child's Signature -----

Parent's Signature -----

In suggesting these foods, please understand that the purpose is to give well-planned and balanced meals and to bring home the fact that wholesome, appetizing, and strength-giving foods are not expensive foods.

When fruit is mentioned, a few of the most important are: (fresh or canned) apple sauce, peaches, pears, plums, oranges, grapefruit, apricots, prunes, cherries, strawberries, and figs. When the vegetables are mentioned, the leafy ones that grow in the sunshine come first: lettuce, cabbage, brussel sprouts, cauliflower, spinach, celery, tomatoes, carrots, beets, string beans, peas, parsnips, greens (outer lettuce leaves, celery tops), turnips, and onions. Have at least one chewy vegetable or fruit in salads cooked or raw.

Cod liver oil is a food, not a medicine. It should be taken during the dark months. Dosage depends upon climate and other foods. A liberal amount of vegetables, fruit, and milk requires less of cod liver oil.

Five to six glasses of water each day. Water should not be taken when food is in the mouth.

Sugar, pastries, and jellies should very seldom be given. They should follow meals. The adult can substitute coffee for milk to a limited extent in the diet.

Monday

BREAKFAST
Fruit
Whole wheat toast
Butter
Cooked cereal
Milk or hot chocolate

LUNCH
Baked potato or
Brown rice
Raw vegetable salad
Whole wheat bread or rolls
Butter
Milk
Apple or orange

DINNER
Meat pie, or meat stew with
onions, carrots, and
potatoes
Cabbage and apple salad
Butter
Whole wheat bread
Milk
Oatmeal cookies

Tuesday

Fruit
Whole wheat toast
Butter
Milk
Poached egg on toast

Vegetable soup
Fruit salad (canned) or
fresh fruit)
Bran muffins or whole wheat
bread
Butter
Milk

Liver
Onions
Potatoes
Cooked tomatoes
Lettuce
Whole wheat bread
Butter
Milk
Apple or pumpkin pi.

Wednesday

Fruit
Whole wheat toast
Butter
Cooked cereal
Milk or hot chocolate

Apple and celery salad
Baked beans
Whole wheat bread
Butter
Milk

Baked potato
Roast meat with carrots
Spinach
Whole wheat bread
Butter
Milk
Fruit

Thursday

Orange
Whole wheat toast
Butter
Hot chocolate

Potato soup
Raw vegetable salad
Graham muffins or
Toast
Butter
Milk
Fruit

Cauliflower
Beets
Meat loaf with tomatoes
Potatoes
Whole wheat bread
Butter
Milk
Custard bread pudding

Friday

Fruit
Soft boiled egg
Whole wheat toast
Butter
Milk

Clam chowder
Crackers
Raw vegetable salad
Whole wheat bread
Butter
Milk
Baked apple

Potatoes
Fish with lemon sauce
Tomatoes
Head lettuce
Whole wheat bread
Butter
Milk
Fruit jello or fruit

Saturday

Fruit
Cooked cereal
Whole wheat toast
Butter
Milk

Scrambled eggs with ham
Fruit salad
Graham muffins
Butter
Milk
Oatmeal cookies or crackers

Tomato soup
Cabbage
Turnips
Baked potato
Large fruit salad with cottage cheese
Whole wheat bread
Butter
Milk

Sunday

Fruit
Waffle with honey
Butter
Milk or hot chocolate

Fruit cocktail
Raw vegetable salad
Carrots
Peas
Chicken or meat
Potatoes
Whole wheat bread
Butter
Milk
Ice cream or fruit

Fruit salad
Cold chicken or meat sandwiches
Hot chocolate
Ice cream or fruit

IF DECIDUOUS TEETH COULD TALK

HARRY B. SHAFER, D.D.S., ANNA, ILL.

IF DECIDUOUS teeth really could talk, I am sure they would be against this gross neglect on the part of some dentists. If every dentist could but realize the importance of preventing caries or certainly of filling deciduous teeth before serious damage had taken place, what a blessing would be the boys and girls who believe in and trust their health to the dentist.

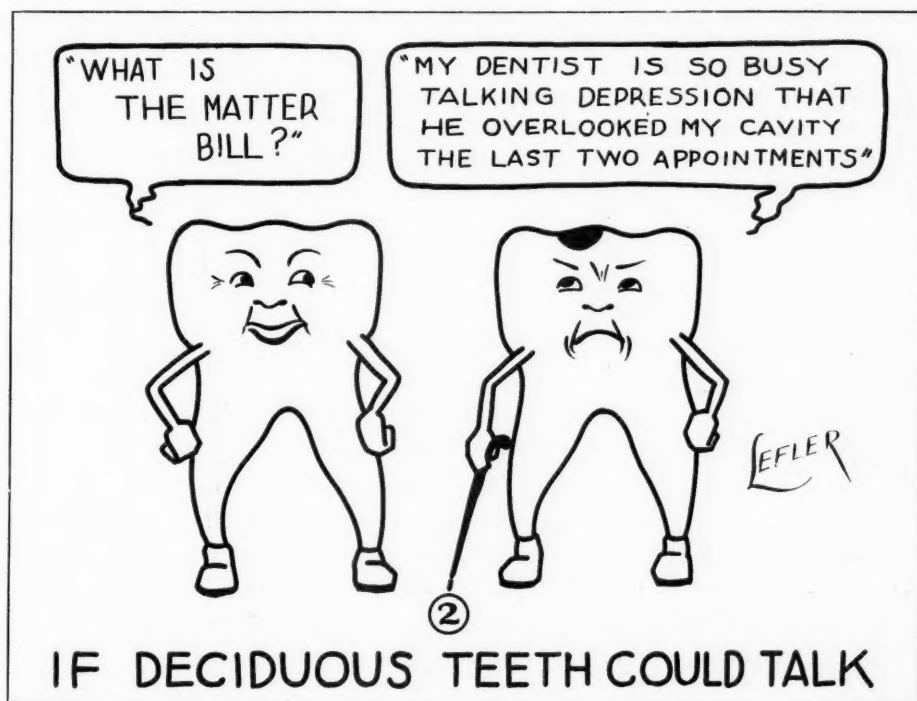


Fig. 1.

Some dentists are so eternally concerned with the depression, with hard times, that they cannot actually see what is before them in the mouths of boys and girls. Brush the occlusal surfaces of the molars, use a powerful light, try a sharp explorer, remember that you are a doctor of dental surgery, with a responsibility. Look, look, look, take a good look, and give the deciduous teeth a chance, don't peep into the mouth, don't wait until the cavity becomes larger; prevent a depression in the health and life of the child patient by preserving his deciduous molars until time for normal and natural replacement by succeeding permanent teeth.

THE DENTAL OFFICE ASSOCIATE AND THE CHILD PATIENT

ADDIBEL FORRESTER, D.N., ATLANTA, GA.

IF THE statement that "the child patient is dentistry's greatest responsibility" is true, it logically follows that it is the duty of the dental profession to educate the parent to the fact that dental services offer a present and future life asset. How can this phase of education be handled in a busy general practitioner's office? The dental office associate is the answer to the problem of educating the parent and preparing the child for future dental service. If the office has a hygienist, she can see the child for a prophylaxis, thus making the first visit pleasant as well as productive to both the child and the dentist. At the first sitting the child is taught how to brush his teeth, and the general routine of the dental office is explained; elementary health talks are given and the child is permitted to familiarize himself with certain instruments, such as the mouth mirror and the engine, thus gaining his confidence so that when it is necessary to see the doctor he has lost his fear of these things.

Instead of using the ordinary towel we use a hand-embroidered bib with nursery rhymes for the preschool child and other suitable stories, varying as the child grows older. A series of dolls made of crêpe paper to represent apples, oranges, carrots, spinach, peas and lettuce are used to attract the child's attention and interest him in proper diet. Just prior to dismissing the child, educational booklets are given to him.

The reception room is made attractive, and a cabinet in one corner of the room is always full of toys that are interesting to children. It is wise never to keep children waiting, but if it is necessary to do so we make an effort to give them constructive toys that will keep them busy until such time as the doctor is ready for them. We find it is best to make short frequent appointments, rather than to overtire them with long sittings.

Even though the child is accompanied by a grown-up, we make him feel that he is the center of attraction, and we try to speak to him as to an equal, as children do not like to be made to feel inferior.

The dental office associate can do much from an economic standpoint by educating the parents to an understanding of the value of their children's teeth, thus enabling them to realize the necessity of paying a proper fee for the doctor's services.

THE PROGRAM OF THE AMERICAN SOCIETY FOR THE PROMOTION OF DENTISTRY FOR CHILDREN

WALTER T. McFALL, D.D.S., MACON, GA.

THE American Society for the Promotion of Dentistry for Children is composed of men and women in the dental profession of America and Canada who are interested in doing better dentistry for children and in seeing that boys and girls everywhere are given the attention, consideration and professional services the profession of dentistry has obligated itself to give. The membership is not composed only of those men and women who practice pedodontia or children's dentistry as a specialty but of all dentists who are interested in children and in seeing that children have better and more adequate dental service. The Society is six years old; it has done splendid work in interesting our dental colleges and universities in the importance of children's dentistry. The editorial support of the leading dental publications has been sought and gained. The attention gained of many state dental association groups has resulted in placing outstanding clinicians and essayists on the annual program to help the general practitioner with the work and problems of children's dentistry. Ardent and harmonious cooperation has repeatedly been given to the mouth hygiene and preventive dentistry section of the American Dental Association, and members of the Society have appeared each year before every section of the American Dental Association. Study clubs and research groups in children's dentistry have been organized in many cities and states. State organizations as component branches of the American Society for the Promotion of Dentistry for Children have been organized and are functioning ably.

Every member of the American Dental Association is invited and urged to attend the next annual meeting of the American Society for the Promotion of Dentistry for Children which will be held in Chicago at the Stevens Hotel on Monday, August 7. The program is as follows:

- 9:00-12:00 A.M. Business meeting and election of officers.
- 12:00- 2:00 P.M. Luncheon with no speech over ten minutes.
- 2:00- 4:30 P.M. Discussion clinics by four or more prominent members.

The discussion clinic will be conducted as follows. The chairman propounds to the clinician and his audience a previously prepared question. The clinician proceeds to *demonstrate* the answer.

If possible it will be arranged that the demonstration will be thrown on a screen that all may see more readily.

At the close of the clinics, the clinicians will meet separately any of the audience having special problems, for as long as the good nature of the clinician holds out.

Dr. H. Shirley Dwyer is chairman of the program committee and is doing everything possible to make this one of the most interesting and most helpful and practical programs ever given on children's dentistry. Information relative to the program may be obtained from Dr. H. Shirley Dwyer, 62 Hanson Place, Brooklyn, New York.

ABSTRACTS OF CURRENT LITERATURE

NUTRITION AND PEDIATRICS

BY SAMUEL ADAMS COHEN, M.D., NEW YORK CITY

It is the purpose of this Journal to review so far as possible the most important literature as it appears in English and foreign periodicals and to present it in abstract form. Authors are requested to send abstracts or reprints of their papers to the publishers.

Calcium Need and Calcium Utilization. Alice R. Bernheim. J. A. M. A. 100: 13, 1933.

Bernheim points out that in 1911 Sherman called attention to the calcium deficiency of the average American dietary; again twenty years later he added that the American dietary could be improved more with an increase of calcium than with any other chemical element. In spite of these and similar statements the author feels that it is indeed unfortunate that the ingestion of adequate calcium intake is taken for granted in the usual American dietary.

Although 0.45 gm. of calcium will furnish the actual daily calcium requirements of an adult, authorities feel that a daily intake of 0.70 gm. is advisable in order to allow for an adequate reserve. In the human being calcium is stored in the bone, and the system can be drained of a considerable amount of calcium without showing a reduced calcium content in the blood or without the occurrence of obvious osteoporosis.

The availability of calcium for the constitution depends upon its intake and also its absorption. Food, water and calcium salts are the sources of the body supply for calcium. Of the more common foods, milk and cheese contain relatively large amounts of calcium. It may surprise many to learn that vegetables and fruits are considered by the author to be an inferior source of supply for calcium, and she emphasizes that which has been frequently pointed out by others, namely, the water used in cooking these foodstuffs and containing mineral salts is usually discarded, thus further lessening the source of calcium.

Calcium is absorbed through the small intestines, and the degree of absorption is governed by (1) the hydrogen-ion concentration within the intestine; (2) the relative proportion of other substances contained in the diet.

Solubility of calcium salts is essential for absorption. Moreover, measures that promote intractintestinal acidity favor the absorption of calcium. On the other hand calcium is insufficiently absorbed or even not at all while the intestinal alkalinity is at its highest. In this respect the author quotes Kahn and Roe, who have shown that calcium may be adequately absorbed from its various salts if they are taken during the interdigestive periods when the intestinal reaction is least alkaline. The author also mentions the work of

Bergeim, who showed that cod liver oil aids the absorption of calcium and phosphorus and also that the absorption of these substances is markedly increased by the addition of lactose to the diet. She further quotes Mellanby, who states that cereals—bread, oatmeal, maize, rice—hinder the calcification of bone.

The author, who writes from the Department of Metabolism and Clinical Research, New York Hospital, and Department of Medicine, Cornell University Medical College, strongly advocates a "high calcium, high vitamin" diet. Animal experimentation and clinical data lead her to believe that many individuals now considered within the boundaries of normal health, will have full health and life with an optimum calcium intake. By "high calcium" diet is meant a daily intake from 0.70 gm. to 1.0 gm. of calcium, and this amount can be covered by the ingestion of a quart of milk or a fourth of a pound of cheese. If for any reason these foods cannot be taken, this amount may be obtained from 80 grains of calcium lactate or 160 grains of calcium gluconate. By "high vitamin" diet is meant some form of vitamin D (the equivalent of 30 drops of viosterol) in addition to from 6 to 8 ounces of orange juice and from 6 to 8 ounces of tomato juice. The author further quotes Sherman, who says "probably each of the vitamins A, C and D bear an important relation to the metabolism of calcium and phosphorus in the development of bones and teeth."

Cod Liver Oil Concentrate (Concentrated Vitamins A and D): Ineffectiveness of Large Doses in the Prophylaxis of Otitis Media Complicating Scarlet Fever. W. D. Sutliff, Edwin H. Place, and Samuel H. Segool. *J. A. M. A.* 100: 10, 1933.

The authors take up the timely question regarding the administration of vitamin A and its effect on resistance to infection. It is practically admitted by all that a deficiency of vitamin A in the diet of animals can and does cause infection, particularly localized purulent infection of the mucous membrane. Because of the lack of definite information regarding the administration of vitamin A in the therapy and prevention of such conditions in the human being as occur in animals, these Boston physicians selected the otitis media following scarlet fever as the most suitable means of testing the anti-infective properties of large doses of cod liver oil concentrate. They hold that otitis media is a uniform condition due usually to a hemolytic streptococcus and developing with uniform frequency, and any influence of the high vitamin A dosage on the incidence of otitis media would lead to significant conclusions in regard to the etiology and treatment of otitis media of scarlet fever and, possibly, in regard to otitis media or sinus infection in general.

As a result of their observations, which were made on 509 patients admitted to Boston City Hospital for scarlet fever and which were admirably carried out and well controlled, these investigators found that the incidence of otitis media in the test and control periods was practically the same. In other words their results are in accord with other investigators when they noticed no difference in the incidence of otitis media which could be attributed to the administration of adequate doses of cod liver oil concentrate.

The Importance of Relative Iodine Deficiencies in Certain Forms of Goiter.

David Marine. J. Am. Diet. A. 9: 1, 1933.

In reviewing the history of the etiology of goiter Marine states that long before anything was known about deficiency of specific elements as causes of disease, the Hindus and Chinese knew about the value of salts in the treatment and prevention of goiter. Today it is known that the beneficial effects of the salt and other products of the sea are due to the iodine they contain.

Although the fundamental or ultimate cause or causes of goiter are still unknown, Marine states that it is now generally accepted that goiter is a work of compensatory hypertrophy of the thyroid and is almost dependent *immediately* (italics author's) upon the deficiency of iodine.

According to this outstanding authority who has made many notable contributions in regard to the etiology of this disease, the quantity of iodine may be deficient in the human because of (1) an inadequate intake of iodine via food and water to cover the normal requirements; (2) even though the intake of iodine may be normal, or for that matter greater than normal, there may be a relative lack of iodine available because of the increased demand of the body for the iodine containing compound known as thyroxin which inhibits the iodine from being held in sufficient concentration in the thyroid gland to prevent it from enlarging; or (3) when simultaneously there is an intake of iodine below the so-called normal requirements coupled with an increased demand for iodine because of an increase of function of the thyroid gland. The last cause, which occurs more frequently, results also in a more severe pathologic entity.

Marine has repeatedly shown that there are many forces at work within the body which act as favorable or unfavorable agencies to the assimilation and utilization of iodine. More recently this authority has demonstrated that even if the iodine intake with the diet is high, there are certain substances nevertheless which are contained in some articles of food which inhibit tissue oxidation to the end that there results a relative starvation of iodine rather than an iodine sufficiency. To state the matter briefly, animal experimentation and clinical evidence have shown that thyroid enlargements due to a relative deficiency of iodine involve many factors of a complex nature, and Marine's extensive experience leads him to state that a deficiency of iodine while highly important as the *immediate* (italics author's) cause of all functional thyroid enlargement is actually one of the many factors involved and probably is not the fundamental factor in most forms of goiter.

Etiology of Acute Rheumatism. Bernard Schlesinger. Brit. M. J. 3772, 1933.

Schlesinger states that until recently rheumatism has been associated with a nonhemolytic streptococcus. Whereas even now the current opinion is that hemolytic streptococcus is considered to be the offending agent, nevertheless this London observer is inclined to believe that the possibility of multiple streptococcus etiology of rheumatism must be accepted. This authority on rheumatism argues that the repeated failure of attempts to demonstrate

streptococcus in the inflammatory lesions of rheumatism is strong evidence against the idea of a great exodus of living bacteria from an inflamed throat into the general circulation.

The author further feels that the old idea of specific infection regarding rheumatism may have to be modified and that attention be directed away from bacteria and focused more on the tissue reaction of the patients. This thought is highly reflected in the increasing popular explanation of bacterial allergy on the lines of serum disease when rheumatism follows nasal pharyngitis or "sore throat." That is to say Schlesinger's opinion is practically in accord with that of Swift and other investigators in the United States, who hold that the tissues of the rheumatic individual seem to be in a state of hypersensitivity because of some chronic inflammation somewhere in the body, most likely in the nasal pharynx. In other words, the soil of the individual rather than the offending agent seems to be the all important factor regarding the onset of rheumatism.

Concerning environmental factors Schlesinger states that although dampness has been rightly blamed as one of the predisposing causes toward rheumatism, he considers changes of temperature equally as important. Other contributing factors to be considered are overcrowding, improper sanitation, and general lack of hygiene. According to Schlesinger, who makes a plea for further research in this field, debilitated children with lymphoid tissue in a permanent catarrhal state and whose nervous system is easily upset and whose digestion is disordered by lack of protein and excessive carbohydrate intake—these children seem to provide a more fertile constitution for the disease. In harmony with many other observers Schlesinger found that rheumatism runs in families, and he states that some children seem to be born with a diathesis toward rheumatism which probably occurs as a result of many causes.

BOOK REVIEWS

Lehrbuch der Orthodontischen Mechanik

Lehrbuch der Orthodontischen Mechanik. By Prof. Dr. Rudolf Winkler, Kieferorthopade an der Universität Frankfurt. Published by J. F. Lehman, Munich.

This is a German text which deals exclusively with the principles of physics and dynamics as applied to the study of orthodontia and the operation of orthodontic appliances.

It attempts to impress upon the student the importance of the physical applications of mechanical principles, and stresses the urgent necessity of complete and comprehensive understanding in regard to mechanical knowledge and applied therapeutics of this character.

The author points out the necessity of a complete knowledge of elementary physics, indicating that mechanics and dynamics form one link that constitutes the basis or fundamentals of orthodontia. No attention is given to diagnosis, treatment, relating to those facts which pertain to the subject from the standpoint of physics. The author takes up the following subject matter in turn: force; addition of forces; forces in equilibrium; forces that produce rotation; levers, etc.; principle of bow and arrow; labial and lingual arch; principle of torque, Angle's ribbon arch; principles applied to pulling down unerupted teeth; modified Jackson's appliance.

This book is of great interest to the everyday active practicing orthodontist, and much information is contained between its covers which is not generally well understood. Notwithstanding the current trend of minimizing the mechanical department of orthodontia, this book appears timely because mechanical orthodontia is highly important to the successful operator; and he who would master the physics as pointed out in this text, must necessarily become a better orthodontist.

Prophylactic Odontotomy

Prophylactic Odontotomy. A Practical and Simple Procedure for the Prevention of Caries in Pit and Fissure Cavities. An Operative Manual Based on the Work of The Hyatt Study Club of New York. Published by The Macmillan Company, New York.

Prophylactic odontotomy, as the term implies, consists of the removal by cutting of a defective part of a tooth in order that the area so treated may be protected from a threatened onset of caries. The operation is confined to those morphologic imperfections called pits and fissures.

The author of this book believes that the adoption and practice of prophylactic odontotomy will greatly reduce the liability of caries in certain specific places. He also makes it plain that as this practice grows and proves its worth, it will add greatly to the prestige of the profession.

The author sums up the advantages of prophylactic odontotomy as follows: (a) Small fillings, hence the minimum possibilities of pulp irritation. (b) Relatively painless operations, as most of the excavation is within the enamel. This results in the early establishment of confidence between patient and operator. (c) Extension for prevention is not necessary. (d) Small and well-finished pit and fissure fillings confer immunity for many years. (e) The serious injury of deep decay is prevented. The danger of recurrent decay is lessened. The book is particularly interesting to dentists interested in children's dentistry and orthodontia.

Text-Book of Orthodontia

A Text-Book of Orthodontia. By Robert H. W. Strang, M.D., D.D.S. Octavo, 756 pages, illustrated with 597 engravings and 4 plates. Cloth. Published by Lea & Febiger, Philadelphia.

This work is based on the theories developed by Dr. Edward H. Angle. It passes on in clear, concise and correlated form the fundamental systematic technic that he expounded. The author obviously believes that the science of orthodontia is lacking in properly compiled textbooks and adequately trained teachers. In this text it is his aim to supply the one and to develop the other.

The author presents in easily assimilable form the operative procedures and the fundamental principles upon which the practitioner may build a practice. The book offers carefully compiled material already in use in graduate instruction in some schools and which he points out have been tested by him and found applicable to the conditions described. The theory and technic here offered propose to give the student a thorough understanding of those portions of the correlated fields of anatomy, dental anatomy, comparative dental anatomy, biology, embryology, physiology, physics and mechanics. It is well organized; its language is clear, simple and readily understandable even in necessarily involved technical description; its logic is convincing and its tenor stimulating. The appendix covers such topics as office equipment, record cards, the handling of each individual case, and the details associated with the beginning of treatment. The abundance of illustrations will be found truly useful, adding much to the value of the work. From a mechanical standpoint the book follows closely the specialized Angle technic and concepts of the late Dr. Edward H. Angle, and makes no claims to describe other types or devices which are in use in the orthodontic field.

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EDITORIALS

Richard Summa

WHEN the late Dr. Edward H. Angle sought a few individuals in whom he felt he would be interested and who he thought might be adapted to the field of orthodontia, in which he was especially interested, Richard Summa was one of these men.

According to the records we have available, it was about 1900 that Richard Summa became interested in orthodontia; he became a student and was graduated from one of Dr. Angle's first classes at the time they were still being held in the city of St. Louis in the very earliest years of this century. Subsequent to this time he was engaged in teaching in the Angle School for a

number of years, was generally recognized as an able scholar, a brilliant teacher and a man of extraordinary background and knowledge in the corollary branches of dentistry.

He was another one of the pioneers of the modern orthodontic movement which began under Dr. Angle's leadership about thirty-three or thirty-four years ago. There was atmosphere and tradition about this group that has gone down in dental history as one of the most extraordinary and enthusiastic things evolved from dentistry of all time. Angle had that rare gift of inspiring his students with tremendous enthusiasm, and in addition to this he was so intensively systematic in his teaching methods that the ideas and ideals he taught were impressed upon all of his students. These earlier teachers, of which Dr. Summa was an important member, absorbed something of this atmosphere in regard to orthodontic teaching and training, and he reflected it throughout his whole life. While in later years Dr. Summa's mind and business interests were diverted into other channels, a few minutes' talk with him at any time or place would quickly reveal that his heart, mind and real interest were still in orthodontia. In the passing within such a short interval of time of each one of three of this original group who started seriously at work on the problems of orthodontia in the early nineteen hundreds, is more than of passing notice. Angle, Dewey and Summa were all men who were devoted to their work. The late Dr. Summa provided the inspiration for the organizing of the American Society of Orthodontia, wrote its first constitution and by-laws and was very active in the deliberations of the Society during its early and formative years. Not unlike a number of the men who really pioneered in the early days of modern orthodontia, Richard Summa was a man of unusual and extraordinary qualities. His implicit honesty, integrity and sincerity of purpose could never be questioned throughout his lifetime by either friend or foe. His courage was unusual and he would fight to the limit for anything which his sense of justice and fairness indicated to him was right and as it should be.

He was a musician by choice, and enjoyed playing with orchestras as a hobby; this reflects his artistic and highly sensitive temperament. The group of pioneer orthodontists already referred to, had ideals for their profession; they believed that everybody should act and cooperate for the benefit of a general cause and not for a cause that was his alone.

In the passing of Richard Summa, orthodontia has lost another one of the trail blazers who made something more than a means of livelihood out of their calling. Another one of the greatest and best educated teachers has passed on to his reward.

Richard Summa wrote the following lines about a year ago and gave them to his friend Edward E. Haverstick; they aptly reflect his temperament.

Let's pluck a hardy flower along the path of life
And for the living build a bower to ease the pangs of strife.
The blooms that grow for after-life sprout oft in selfish soil;
Too withered, they are, and shriveled to soothe the scars of toil.
Their fragrance fails to penetrate into our realm of hope;
Malodorous becomes their scent when belated blossoms grope.

Who Is Responsible and Why

THE dental profession has a definite responsibility in educating the public in all phases of preventive dentistry. Fundamentally, preventive dentistry is dentistry for children. While it admits the value of prevention, the profession generally is not completely sold on the idea, as it makes only a pretense of supplying the necessary service. Failure to visualize a plan that offers even a possibility of receiving proper remuneration is apparently the reason for lack of cooperation, not of the public, but of the profession. It is easy to become idealistic verbally but difficult to make the physical effort to realize the ideal, unless we get paid for it.

A recent article in this Journal referred to orthodontists as a group with "a halo of aloofness and a mightier-than-thou attitude." Apparently the economic discussion offered an opportunity to the uninformed to criticize. Constant repetition of a misstatement has molded a universal belief that orthodontic fees are excessive. Top fees of a limited number of orthodontists have been given as the universal standard. The amount of the average fee of several hundred orthodontists would be a surprise and a revelation to the uninformed. The value of materials used in appliances and the time consumed in proper construction equal and often exceed the same items in bridgework restorations, and to be efficient the appliances certainly require an equal amount of exactitude. The average fees are similar. Specialists in the practice of dentistry for children have not, except in a few instances, made their own field, but have accepted an insistent demand that children be given greater consideration than that which is usually rendered an aching tooth in a squawking child. According to the literature, it might be mentioned that orthodontia has done more than and at present is doing as much to teach and preach dentistry for children as any other branch of dentistry.

Economic conditions, together with a desire to render a greater service through proper observation and prevention, will in addition to filling his unproductive hours make it necessary that the orthodontist really practice what he has been preaching. If it be a fact that delayed loss or too early removal of deciduous teeth really tends to produce malocclusion, or if proper oral prophylaxis and regular inspection prevent excessive decay with its attending ills, or that regular x-ray observation of the deciduous denture permits early recognition of anomalies, the correction of which prevents malocclusion, then the orthodontist is really rendering a greater service to his patients if his practice includes true prevention measures of malocclusion.

The average dentist is rapidly giving more of his time to orthodontic treatment; and with laboratory diagnosis, appliances and instructions, he is receiving a small return for the time involved. Admitting for the sake of argument that the end-results are ideal, he is nevertheless overlooking a field for which he should be more properly fitted and which would net him several times the financial return, not to mention the greater service that would be rendered through proper care of his little patients. The majority of the orthodontic cases treated by the general practitioner have been started under the excuse that the dentist was forced to extend treatment on account of the inability of

the patient to go to an orthodontist. It is not being unfair to assume that this case of malocclusion has been developing under his observation. The basic reason that a majority of such cases are treated is a desire to collect what appears to be a very large down payment. If this fee was divided equally among and received from a dozen young patients as a yearly payment for early prevention of dental ills, the dentist would expend less effort and be additionally repaid in knowing that he was rendering a far greater service. Dentistry began as, and as generally practiced today is, the correction of ills after they have occurred rather than early prevention. Orthodontists are also overlooking a very productive field in not having several hundred children, beginning at the age of four years or less, under regular observation and including in their practice such definite prevention of malocclusion measures as they may deem necessary. A nominal charge, not by the visit but by the year, will make it possible to give appointments often and at the time desired. Cooperation will be easily secured, as the services will be already paid for and the patients who later may need more active corrective treatment will usually have been under observation for some time, will be familiar with the operator and office procedure and, more important, will probably need less assistance, making in the end a decided financial saving to the patient and also enhancing the possibility of a far better end-result. Any average orthodontic practice has many cases under treatment that could have been greatly simplified with earlier attention. Growth deficiencies in a patient fourteen years of age, for example, offer a very difficult problem for the orthodontist; assuredly he would be better prepared and much progress could have been made if the patient had been under his observation for the past six, eight or ten years. Practicing prevention aids is as much the duty of the specialist as placing a ligature. Orthodontic treatment for the masses is a myth, at a fee commensurate to the expense and time involved, except through a practical plan of prevention.

Differences of opinion may exist as to the method of the orthodontist's approach to the public, but there is no room for argument against the need for, or for our failure to formulate, a systematic plan that will really aid. Organized minorities control and direct the thoughts and actions of the uninformed majorities. Saber rattling quickens enthusiasm for noble professional traditions and ax grinding makes it possible to settle personal grievances, but in the end the rank and file really pay the costs. The public's thundering applause, instead of showing its appreciation for our mythical professional ethics and dignity, is really an evidence of welcome to panel dentistry or mass service production, because the public will take and will willingly accept all, be it good or bad, which it has been led to believe, through the printed page, to be the best. The mouse trap theory is a delightful story, but it was originated before the advent of the neon sign. After endless discussion of how, when, why and who to educate, with as yet no apparently noticeable improvement, one sometimes wonders if there is any value in the warning cry of "Wolf!!! WOLF!!!!" One also wonders, as old man Time makes it more difficult to earn the elusive dollar, whether it would not be better to practice what one preaches, to endeavor to make one's

cases, if possible, easier to treat, to try really to practice preventive orthodontia, and to avoid being the kind of specialist "who knows more and more about less and less." If this view is to be termed "high hat," who is responsible and why?

—P. G. S.

Rackets and Progress

IT HAS been said that the person who appreciates good service can usually obtain such service. Was it not Emerson who uttered the time-honored words about an artisan, though he makes only a mousetrap, if he makes it better than anyone else, the world will make a beaten path to his door?

Below appears the modest advertisement of a modern orthodontic mousetrap maker which will interest orthodontists throughout the world, as the funny sheet of the Sunday newspaper interests a twelve-year-old boy. The advertisement appeared only recently in the St. Louis *Globe-Democrat*, a daily newspaper, and is reprinted here as a human interest story.

To the initiated even though it is recognized as "bait," it exposes in the author of the advertisement not only ignorance but a combination of egotism and courage that is rare in the annals of dental history. This will also interest the American Board of Orthodontia, because here apparently can be found exceptional and unusual orthodontic talent that has been overlooked. This light has been apparently buried under a bushel basket.

The advertisement follows:

"SCHOOL'S OUT! VACATION'S HERE!

"Now is the time to have your children's teeth straightened. For twenty-five years I have specialized in this branch of dentistry. Starting with big clumsy appliances, through a gradual process of elimination, I have now perfected a system of my own. No outside braces need be worn, and three months' time is all I require to regulate the most difficult case for any child under fourteen years of age. Special rates for the summer months now in effect! Consult me first!"

When Dr. J. C. Wood, eminent elderly Cleveland surgeon, took with him from college a clinical thermometer, his colleagues in the town where he located sneered; and this was away back in 1879. In order to be entirely charitable and tolerant, orthodontists may recognize in the above ad the clinical thermometer of 1933. Or perhaps it is just another new racket making its popular debut in 1933.

—H. C. P.

In Memoriam

Dr. Richard Summa

ON APRIL 8, 1933, Dr. Richard Summa died suddenly of a heart attack. Dr. Summa was born in Nordlingen, Bavaria, Germany, son of Ulrich and Frances Summa. His father was a lawyer, a scholar and graduate of a local university. Richard was the youngest of ten children. At the age of nine he was brought by his parents to St. Louis, where he graduated from a public high school. He attended the College of Dentistry of the University of Iowa and was graduated in the class of 1890. He opened an office immediately in St. Louis and practiced there until 1915. About 1900 he became interested in the practice of orthodontia, and was graduated from the Angle School of Orthodontia in one of the first classes. For several years thereafter he assisted Dr. Angle in conducting the work of the school in St. Louis. He was very active and exerted a great influence in the development of orthodontia, especially from 1900 to 1910. He was one of the organizers of the American Society of Orthodontists and was largely responsible for the conduct of the first journal of orthodontia, *The American Orthodontist*. In 1915 he gave up general practice to become Professor of Orthodontia in Prosthetic Dentistry in the University of Iowa, which position he was forced to resign in 1918 on account of his German ancestry. It was one of the many tragedies of the kind at that time and to those who knew him it seemed most unfortunate, for he was a loyal American citizen devoted to its principles and ideals and as a German was a rabid anti-imperialist. After leaving Iowa he became interested in a demoralized sand business which he bought out and by his ability and knowledge built it up to the point where he finally sold it for a sufficient sum to give him a moderate income for the rest of his life.

He had two brothers, both prominent physicians in the practice of medicine in St. Louis.

Dr. Summa had a remarkably brilliant intellect, but he felt keenly defects in his education and never gained confidence in the workings of his own mind. He was a talented musician, keen and sensitive in esthetic appreciation. He was always an idealist and was devoted to the finest ideals both in professional and in personal life. The following lines which were found among his papers show something of the quality of his mind.

“Friendship is a gem sublime
Enhanced by years of fleeting time;
Honor is a source of pride
Which only friendship can betide.”

—Frederick B. Noyes.

NEWS AND NOTES

American Society of Orthodontists—Onward to Oklahoma City

November, with the annual meeting of the American Society of Orthodontists, looms in the offing. Soon the orthodontic clan will be foregathering for the thirty-third annual meeting, and we trust that everyone will make a special effort to be there. President Bill Flesher and his capable coworkers have long been working faithfully, and have prepared a very attractive program. The Oklahoma State Dental Society has paid our specialty a rare compliment in arranging its meeting for part of the same week, and an unusual opportunity to meet and exchange opinion with the general practitioner is thereby offered.

It will have been a year and one-half since the last meeting, and this seems a long time for the faithful. The president of the United States has requested that in all endeavors, the citizens have faith and courage, and carry on to an early revival. Here is our chance, our bounden duty, to be one of those who "kept the faith" when the keeping means so unusually much. We, as a Society, are the true leaders of our specialty. Unusual conditions have compelled, for this year, the meeting to be held at a time out of the ordinary, but with a little planning, it would seem that almost everyone can arrange for this once. Hotel accommodations are at a moderate cost and are of the best and the surroundings are most attractive. There will be ample compensations in the excellence of program, the unusual opportunity for good fellowship, and the consciousness of "standing by" our president. Your opinion will also be needed in deciding several important problems for the progress of our Society. We are going forward so fast that wise guidance is needed at this period of our development, and your presence and your voice are especially needed to guide your officers for future plans.

THE TIME, THE PLACE, THE PROGRAM.
SEE YOU IN OKLAHOMA CITY!!

L. M. WAUGH.

The American Board of Orthodontia

The fourth annual meeting of the American Board of Orthodontia will be held in Oklahoma City at the Biltmore Hotel on November 6 and 7, 1933.

Those orthodontists who desire to qualify for a certificate from the Board should secure the necessary application form from the secretary. Applications received up to the date of the meeting in Oklahoma City will receive preliminary consideration by the Board and the required examination will be outlined. It will not be necessary for new applicants to appear before the Board at this time. However, such applicants should appear before the Board at the next annual meeting.

Attention is called to the following resolutions adopted by the Board:

Any person desiring to make application to the Board for a certificate shall have been in the exclusive practice of orthodontia for a period of not less than five years or an equivalent to be determined by the Board and based upon the following conditions:

First, an instructor in orthodontia in a school satisfactory to the Board.

Second, an associate in the office of an orthodontist whose standing is satisfactory to the Board.

It is, however, definitely to be understood that any person at the time of making application for a certificate shall be in the exclusive practice of orthodontia in his own name.

ALBERT H. KETCHAM, President,
Republic Building,
Denver, Colo.

OREN A. OLIVER, Secretary.
Medical Arts Building,
Nashville, Tenn.

Chicago Centennial Dental Congress

The Chicago Centennial Dental Congress, in conjunction with which the Diamond Jubilee of the American Dental Association will be held, will convene at the Stevens Hotel, August 7 to 12, inclusive.

Thousands Prepare for Trek to Chicago

In one month the attention of the dental world will be focused on Chicago, the site of the Chicago Centennial Dental Congress, as a part of which the American Dental Association will hold its seventy-fifth annual session. Preparations have been made to handle a record attendance of dentists from all parts of the world during the week of August 7-12 inclusive.

Never in the history of dental meetings has the vacation appeal been so strong, largely, of course, because of the spontaneous and overwhelming success of Chicago's second world's fair, A Century of Progress International Exposition. If six months ago anyone had predicted that the Exposition would open four days in advance and in the first few weeks of its existence outnumber all previous attendance records for comparable expositions, he would have been branded an incurable enthusiast. Yet, that is exactly what has been accomplished.

Dentists and their families who attend the Dental Congress will have ample opportunity to "do the Fair" thoroughly and take home never-to-be-forgotten memories of the most glorious vacation imaginable. Ranking number one is the Exposition which unfolds the magic of modern science in such a manner as to intrigue even the most sophisticated. At night, the grounds, illuminated by millions of lights, become a veritable fairyland. It is readily admitted that the lighting effects of the Fair are a triumph of modern electrical engineering.

The Exposition, however, does not constitute the sole attraction for Congress visitors. During the week there will be social functions for the members and their families; fraternity banquets and alumni dinners. Thursday evening has been set aside and designated as Gala Night at the Exposition. The Court of the Hall of Science, which can accommodate 15,000 persons, has been placed at the disposal of the Congress. Exercises will be held there that night culminating in an address by United States Senator Henrik M. Shipstead of Minnesota, who, so far as is known, is the only dentist ever to sit in the Senate. The remainder of the evening may be spent in dancing and entertainment in special facilities on the Fair grounds.

The principal attraction for the women will be a luncheon and bridge to be held at Chicago's famous Edgewater Beach Hotel. Every woman who visits the Congress will consider this event one of the high lights of the week.

To climax the social week an informal dinner dance has been arranged to be held in the Grand Ballroom of the Stevens Hotel Friday night. In addition to the excellent cuisine and music by one of Chicago's leading dance bands, entertainers have been secured from among the headliners of the radio and vaudeville world.

The Congress will present a well-balanced program by essayists and clinicians representative of the profession in all quarters of the globe. The information available from the scientific program will be supplemented by the largest and most elaborate commercial exhibit ever staged. Add to this the vacation aspect, and it is little wonder that arrangements have been made to accommodate a record-breaking gathering.

Forget your cares and come to Chicago for an inspiring, thrilling and profitable week.

American Society for the Promotion of Dentistry for Children

The American Society for the Promotion of Dentistry for Children will hold its seventh annual luncheon and business meeting on Monday, August 7, 1933, at the Stevens Hotel, Chicago.

All members of the American Dental Association are cordially invited to be present.

American Society of Oral Surgeons and Exodontists

The fifteenth annual meeting of the American Society of Oral Surgeons and Exodontists will be held in the Stevens Hotel, Chicago, August 4 and 5.

A. L. FREW, President,
4105 Live Oak Street,
Dallas, Texas.

HARRY BEAR, Secretary,
410 Professional Building,
Richmond, Va.

Association of American Women Dentists

The twelfth annual meeting of the Association of American Women Dentists will be held at the Stevens Hotel, Chicago, on August 7, 1933.

A cordial invitation is extended to all women dentists.

GENEVA E. GROTH,
1301 Medical Arts Building,
Philadelphia, Pa.

American Dental Assistants Association

The Stevens Hotel has been designated as headquarters for the ninth annual meeting of the American Dental Assistants Association which will be held in Chicago, August 7 to 12. For further information address

RUTH M. CLARK, General Secretary,
Suite 1-4, Scofield Building,
Minot, N. D.

Omicron Kappa Upsilon

The first national get-together of the members of Omicron Kappa Upsilon will be a luncheon on Thursday, August 10, at the Stevens Hotel, Chicago.

This gathering will be one of the features of the Centennial Dental Congress, and as a large attendance is expected, members are urged to make early reservation through the office of the supreme secretary.

DR. H. E. FRIESELL, Supreme President.
DR. A. HOFFMAN, Supreme Secretary,
311 East Chicago Avenue,
Chicago, Ill.

Items of Interest

Dr. H. E. Abelson and Dr. Ludwig Moss associated with the late Dr. Martin Dewey announce the continuance of his practice. Limited to orthodontia, 17 Park Avenue, New York, N. Y.

Dr. Guy B. Fairchild announces the removal of his offices to 601 Medical Arts Building, Duluth, Minn. Practice limited to orthodontia.